



AGRICULTURAL RESEARCH INSTITUTE

PUSA

JOURNAL
OF THE
British Dairy Farmers'
ASSOCIATION.

Vol. XXII.

1908.

PRICE 1s. (*Free to Members.*)

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London:

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CAERPHILLY CHEESE IN SOMERSET.

By J. H. BURTON, M.Sc., County Education Office,
Weston-Super-Mare.

Visitors to the Dairy Show must have noticed of recent years that the classes for the above variety of cheese contain a larger number of English than of Welsh exhibits, and that the prizes frequently go to the former. In the same way that the Scotchmen have made a raid upon the makers of English Cheddar cheese so have the Englishmen made a raid upon the Welshmen, and with much the same result.

A closer scrutiny of the above entries would show that the greater number of the English exhibits hail from the County of Somerset, and the object of this article is to trace the origin and development of the manufacture of this variety of cheese in this particular county. In passing, it may be stated that the industry has now become one of considerable size and importance, the history of which contains a valuable lesson on self-help.

Caerphilly cheese has been made in Wales for many years, but until some 18 or 20 years ago its manufacture was apparently confined to a limited area in South Wales and Monmouthshire. It is still strictly a local cheese, the name even now being unknown in many parts of the country. Caerphilly, from which the cheese takes its name, is a small town in the Rhondda Valley in the heart of the mining district of South Wales, and this kind of cheese was then, and is still, in great demand amongst the Welsh miners. If we look at a map of England we see that the County of Somerset is divided from this area by the Bristol Channel, which is here only some 8 or 10 miles wide. In the summer months there is a daily service of boats between Cardiff and Weston-super-Mare, and thus every opportunity is afforded for the people on the two sides of the Channel to become acquainted with each others' tastes and pursuits. It is pretty certain, therefore, that the introduction of the manufacture of Caerphilly cheese into Somerset was largely due to geographical position, and that those who first took it up were influenced by the knowledge that a market for this article lay close at hand.

Somerset has from time immemorial been associated with the manufacture of Cheddar cheese, but it would be a mistake to suppose that every farm is adapted to the making of the best quality Cheddar. As a rule the best cheese is not made on the best land, medium soil with good water supply and drainage, and preferably on a limestone formation, producing the best article. There are in the county considerable areas of deep rich flats which are excellently adapted for milk or meat production, but on which it is difficult to make

first-class Cheddar. One such area runs in from the mouth of the River Brue at Burnham through the parishes of Mark and Brent as far as Wedmore. The soil is a marine alluvium; it is rich, but very flat, and intersected with "rhines" or ditches, in which the water is—during the summer months at any rate—almost stagnant. Whether the difficulty is connected with the water supply, or whether it is due to the forcing nature of the herbage, which produces a milk liable to rapid fermentative changes, is not clearly known, but the fact remains that on this and similar areas "taints" are very prevalent, and it is, generally speaking, difficult to produce a cheese of mild agreeable flavour. The land naturally produces a rich cheese, the difficulty is to get a cheese of "clean" flavour.

Some 18 or 20 years ago, when Canadian and American competition was beginning to make itself felt, it did not pay to make a second-rate article, the outlook at the time was anything but rosy for makers in this area, and it was then that Caerphilly cheese was introduced.

So far as the writer can ascertain, the first makers were Messrs. Robert Cook and William Corner, of East Brent, near Highbridge, and they found their land well adapted to the manufacture of a rich Caerphilly cheese of good flavour, and much more remunerative than the making of Cheddar cheese at the prices then ruling. The result was that at first the process was guarded as a close secret, but gradually the knowledge spread, from £1 to £5 being paid for a few lessons. Since then (18 years ago) the number of makers has annually increased, and it is still growing. At the present time a considerable area extending for a radius of 12 or 15 miles from Highbridge, which used to be devoted to Cheddar cheese, is now given up to the Caerphilly variety, while the manufacture has spread to distant parts of the county, and even into the adjacent counties of Wiltshire, Dorset, and Devonshire.

As the number of makers increased, so the difficulty of marketing the produce began to be felt. At first cheese was sent direct to buyers in Wales, but it soon became evident that the new source of supply was not sufficiently well known in the Principality, and there was a difficulty in makers and buyers getting into communication. After careful consideration of the whole question, it was decided to start at the small market town of Highbridge a periodical sale of cheese by auction, which should be well advertised on the Welsh side. On November 20th, 1899, the first sale was held, 13 lots of cheese being "pitched," which realised £61. The excellent quality of much of the cheese made soon attracted the notice of Welsh buyers; the auction became a weekly one, and it became increasingly successful as time went on. In 12 months the number of lots sold increased to 52, the money value being £496; while in less than two years the lots sold reached the total of 110, the money value of which was £854. During the past season as many as 200 lots of cheese have been "pitched" at one sale, and every week a weight of cheese varying from 10 to 35 tons, according to the time of year,

is sold by auction. Nor does this represent the total make of the county, a large quantity of cheese finding its way direct to dealers in Wales. Thus, a very important industry has gradually developed.

The prices realised at the weekly auctions vary from 45s. to over 70s. per cwt. During last season the highest price realised was 74s. per cwt., while the highest price this season has been 76s. per cwt. Naturally the lowest prices are realised in the spring months, when there is a flush of milk; while the best returns are obtained during the winter months, when milk is scarce, and the output is thereby limited.

At the time that the Highbridge auction was started the cheese offered for sale varied enormously in quality, the difference in the value of various lots being frequently as much as £1 per cwt. The effect of public sale and competition, however, soon began to make itself felt in a levelling up of the quality of the cheese offered. For the last two or three years the quality has been remarkably uniform, the value of the bulk of the cheese sold varying as little as two or three shillings per cwt. For some years, too, instruction in Caerphilly cheese-making has been given during the month of November in the Cheese School, conducted formerly by the Bath and West of England Society, but latterly by the Agricultural Instruction Committee of the Somerset County Council, while recently further instruction, especially in the use of the "starter," has been given by the itinerant Instructress (Miss J. Stubbs) employed by the latter Committee. It is reasonable to suppose that some of the improvement noted has resulted from the provision of such instruction; but be that as it may, it is safe to say that the bulk of Caerphilly cheese made in Somerset is now remarkably uniform in quality, and that the quality is distinctly good.

For the benefit of those who are not familiar with this cheese, it may be stated that each cheese weighs about 8 or 9 lbs. It belongs to the class of lightly pressed cheese, which are sold in the "green" or young condition. The cheese mostly resembles Derby among English makes, but it is sold even "greener" than the latter, the usual age when sold being ten days to a fortnight. Though the flavour is much appreciated by the Welsh miners, by whom it is cut off in thick chunks, it does not commend itself to the ordinary cheese eater, being too new and insipid. It is, however, excellent for toasting. When cut, the cheese should be as white as possible; it should be firm in texture, i.e., almost entirely free from holes, and it should break "short" or brittle. Dealers like the skin of the cheese coated with either blue or white mould, the latter being preferred. Generally speaking, the cheese is a whole-milk one, and for nine months of the twelve it probably does not pay to remove any cream owing to the loss of quality and weight which results. During the winter months, however, when the milk is very rich it may even be advisable to do so, as otherwise the brittle character—the true Caerphilly one—cannot be obtained.

I am indebted to Miss Jessie Stubbs, the itinerant Instructress in cheese-making for the Somerset County Council, for the following account of the method of manufacture as taught by her :—

“ The method of making Caerphilly cheese varies with the length of time they are kept before being marketed. Sour or acid cheese take longer to mature, hence sweet cheese are more profitable, as they show quality at a much earlier date, and so do not shrink to the same extent as sour ones. In the summer months the milk is made up daily, but during the cold weather only once or twice each week, as all farmers did, and may do still, find great difficulty in obtaining the desired amount of acidity during the winter period unless the milk is very stale. The difficulty of obtaining acidity or sourness has been overcome in a number of Caerphilly dairies by the introduction of a “ pure starter,” so if the quantity of milk is large enough it may be made up every day with as much ease as it if were the middle of summer.

“ The evening's milk is strained into the cheese tub and stirred occasionally to prevent the cream from rising, or if the day has been close and hot it should be cooled to 70° F. or under as soon as it is brought into the dairy. This prevents the milk from developing acidity during the night, and also makes the cheese more regular. Next morning starter is added at the rate of 1 quart per 100 gallons of milk and the night's milk heated to 90° F. It is then left for the acidity to develop, and the addition of the morning's milk. When all the milk is in, take a test with the acidimeter, and when the acidity is .01 higher than on the previous evening, put in the rennet. The amount of rennet varies on different farms, but usually speaking the quantity is 1 oz. to 50 gallons of milk. This will, if there is sufficient acidity present, thicken or coagulate the milk in three-quarters of an hour. The temperature for renneting depends on the time of year. As a rule it should be from 86° to 90° F. When firm the curd is cut with American knives into pieces about the size of broad beans, and then gently stirred with the shovel breaker for 20 minutes, or until the curd is firm. The maker must use his or her own judgment at this stage, as the degree of firmness varies with the quality of the milk (the curd from rich milk requiring more firming than that from poor). After the right degree of firmness has been obtained the stirring ceases, and a test is taken to enable the maker to calculate the length of time before drawing off the whey. If the test shows the acidity to be .15 the curd is allowed to “ pitch ” or settle for half-an-hour. It is then pushed back with the hands from the tap and the whey started off. If the curd is well pushed back from the tap the whey drains off, leaving the curd comparatively dry. This is now cut round the sides of the tub, piled in the centre, and allowed to drain for 15 or 20 minutes. Then cut into oblong pieces, throw the curd from outside into the centre, again pile, and test for acidity. If the acidity is .2 to .25, leave for 20 minutes, and the curd is then ready to vat. No salt should be added. Take 9 to 11 lbs. of curd for each

cheese, according to the size of the vat, and carefully break it into the vat by hand without squeezing it, as unless care is taken over the breaking a loss of fat will occur. The cheese are now placed in the press with about 4 cwt. pressure applied. Then take a test : the drainings from the press should be .3 to .35. In three-quarters of an hour the cheese are turned, and a little salt is rubbed on the outside to prevent the cloths from sticking. The cheese are then returned to the press, increasing the pressure to 6 cwt. Leave in the press until the following day. A brine, strong enough to float an egg is prepared, and next morning the cheese are taken from the press and placed in the brine, with a small handful of salt on the top of each. At night they are turned, and the other side salted. The following day the cheese are taken from the brine and the moisture wiped off with a damp cloth, after which they are taken to the curing room. There should be a certain amount of draught through the curing room, as this will make the cheese coat faster, and they should be turned daily until ready to market. Some makers sell out weekly, keeping only about 8 days' cheese in hand."

The special points in favour of this cheese are :—

1. It can be made all the year round, and not only during the spring and summer months, the highest prices being obtained during the colder months, and in the Highbridge district it is so manufactured on the majority of farms. Since the revival in the price of English Cheddar cheese many makers have, however, turned their attention to Cheddar during the summer months. On the other hand, regular makers of Cheddar are in increasing numbers, making Caerphilly during the early spring and late autumn months, or even during the winter months, instead of selling their milk as hitherto, and this seems an ideal combination.

2. Being sold at about a fortnight old the cheese weighs heavily, at least 25 per cent. more weight being obtained than of Cheddar. For the same reason it is practically a ready-money business. Taking the average prices of the two varieties of cheese one year with another, it is practically certain that for the above reasons the Caerphilly is the more profitable, and this was certainly so during the lean years and in the area where the manufacture first established itself in Somerset. With the higher prices obtaining during the past two seasons for Cheddar cheese there has been a corresponding advance in the price of Caerphilly, and at the time of writing the price of the latter actually exceeds that of the former.

3. The process of manufacture is comparatively simple and easily learnt. The cheese is sold and eaten before "taints" have time to develop and spoil the flavour, and this especially adapts the cheese to rich "strong" land, which is unsuited to high-class Cheddar. Indeed, it is found that the best quality Caerphilly is produced on such land.

The charge is frequently brought against the British farmer, especially by irresponsible critics, that he is entirely behind the times, and shows a complete inability to adapt himself to changed

conditions. He is conjured to take lessons from the Dane, the German, and the American, though in the opinion of many observers he has little to learn from any of them. It is seldom that a voice is raised in the press or elsewhere in his defence, and feeling this the writer thought it would be well to show how, in one instance at any rate, the industry of a large area of one of our most important dairying counties has, without blowing of trumpets or noisy advertising, been completely altered, and how the farmers of that area have by their energy and intelligence built up a vigorous and thriving industry in place of what was to then at best a precarious one. All honour to them for it.

WHAT IS POSSIBLE IN THE SALE OF MILK AND CREAM?

By PROFESSOR JAMES LONG.

The consumption of milk in this country is so small that it is a reflection on the intelligence of the English people. Although not precisely known, the quantity we drink is about three-eighths of a pint per head per day—man, woman, and child. Some years ago I made an estimate, showing that our cows—at that time numbering 3,925,486—85 per cent. of which were assumed to be in milk, produced, at an average of 420 gallons per head, 1,401,398,880 gallons of milk. On the estimate that the milk consumed was at the rate of 13 gallons per head, and that the total quantity was handled as in the following table, I was enabled to show a close approximation between production and consumption :—

Milk produced in the United Kingdom, and consumed as

(1) *Milk*, (2) *Butter*, (3) *Cheese*.

	Gallons.
Milk consumed, at 13 gallons per head . . .	505,700,000
Milk utilised for butter-making, at 2·8 gallons per lb.	609,952,000
Milk used for cheese-making, at 1 gallon per lb.	307,310,000
Milk used for condensing	8,000,000
	<hr/>
	1,430,962,000
Deduct separated milk sold as whole milk . .	25,000,000
	<hr/>
Total milk consumed (estimate)	1,405,962,000
Milk produced as estimated above	1,401,398,880

In the Agricultural Returns of 1906 the number of cows and heifers shown in the previous year was 4,211,000, so that the quantity of milk is now larger than in the estimate to which I have referred. If we turn, however, to the consumption of beer, we find that in England the average quantity consumed per head was 31·3 gallons, or nearly 2½ times as much as milk. If, however, we were able to eliminate the children and abstainers from the total number of the population, we should probably find that the consumption of beer per head was twice as large as the figures show.

We may perhaps assume that tasty drinks, like most of those containing alcohol, appeal more strongly to the palate than a simple glass of milk, and for this reason they are preferred. Yet milk, which costs much less than beer, is not only a beverage, but

an almost perfect food, upon which the infant lives and children grow, and one which should form part of the daily ration of every human being. This fact cannot be too widely known. Why should not the farmer and the trader, by combining forces, work a propaganda and teach the million what milk really is? Every brewer and distiller in the land make known the virtues of their goods, with what results we know. We do not, however, find the brewer informing the general public that his beer is food, or what that beer contains, although he dilates upon its sparkling and tasty properties. On the other hand, the dairy farmer and the milk retailer can tell consumers that in every pint of average fluid milk the solid food weighs $2\frac{1}{2}$ oz., and consists of butter, sugar, and casein, equal to half a pound of beef.

Again, a perfect food must be easily absorbed and cheap to buy. New milk fulfils both these conditions. Its absorption is more perfect than that of any other food and gives less trouble to the digestive organs. We are told by leading physicians of the day that new milk checks the process of putrefaction in the intestines, and, according to Bendix and Cautley, it is absorbed as well after some hours of boiling as when just boiled, and, further, that there is no appreciable difference in the digestibility as between raw milk and milk which has been boiled. It is, too, claimed by Mechnikoff, the chief of the Pasteur Institute, that sour milk destroys the putrefactive germs which cause such trouble in the large intestine. Points like these should be studied carefully by heads of families, not only with the object of providing a larger supply of milk to members of each household, but of showing them, by daily practice and instruction, that health is maintained the better and the longer, and life made more enjoyable, by making milk a standard article of food.

It has been pointed out by Hutchison and others that although milk is rich in protein, it appears to yield no uric acid, and that inasmuch as casein, the chief of milk proteids, when split up yields no carbohydrate, its value is enhanced in certain cases of disease. The sugar or lactose, which forms a large proportion of its nutrient matter, is almost free from sweetness, and differs largely from the sugars of the table; but what is much more important is that fermentation by the aid of yeast is rendered difficult, so that it is better borne by those who suffer from intestinal troubles, although there are many cases in which, owing to the presence of bacteria, lactic acid is produced, just as when milk is soured by long exposure to the air, and especially in warm weather.

The fat of milk is digested more completely than fat of any other kind, owing chiefly to the fact that it is split up into particles of microscopic size, so small, indeed, that in a mixed sample the average diameter is $\frac{1}{13,000}$. In a similar sample the average number of globules of fat in the ten thousandth part of a cubic millimeter was estimated at 152, and this figure was arrived at on the basis of 150 examinations of the milk of 15 cows of half a dozen breeds—

a millimeter being the one-thousandth of a meter (the French yard) of 39 inches, in round numbers. The sugar of milk is believed to be equally as well absorbed as fat, while the casein is more completely digested than any other form of protein. Although rich milk—by which we mean milk rich in fat—is in such demand, it does not suit all consumers, and is therefore frequently diluted to make it more digestible. And yet, again, milk is regarded as of too watery a character to be a perfect food, although when given to children this influence affects them less than the men and women. Where an invalid is put on milk diet, the quality—*i.e.*, the fat percentage—should be known. To supply a food in large quantities from day to day which is sometimes rich and sometimes poor in fat may contribute to the troubles of digestion. There are few foods which differ so much in feeding properties; while poor milk contains as low as 3 per cent. of fat, which is the minimum standard, rich milk may contain as much as $5\frac{1}{2}$ per cent., or even more. Thus it is that milk is sometimes blamed as a food unsuitable, and then rejected altogether. Milk from a mixed herd of cows is much more likely to suit the infant and the invalid, and there is no scientific reason why an infant should require the milk from a particular cow, which may supply more fat than is required, and which is never so suitable as that which is specially prepared or humanised.

There is some change in milk which has been boiled. It has been stated, for example, that by boiling milk for 15 minutes a portion of the casein is rendered indigestible; but weighing all the evidence, which is most conflicting, there would appear to be little, if any, difference in the feeding value of milk whether consumed raw or boiled. One of the most simple methods of preparing milk is by coagulation into junket which has been well sweetened and flavoured, and yet there is no richer food than farinaceous puddings made with whole milk, cooked sufficiently long to remove about one-half the moisture. The milk is thus condensed, and being well mixed with the dry food employed, whether rice or semolina and the like, it does not clot on entering the stomach, as in the case of liquid milk, and is therefore digested with greater ease. Milk is changed in character by bacteria, which produce lactic acid, or which, if pathogenic, cause disease; but although there are some exceptions, it is believed that all organisms are destroyed if milk is heated to 170° F. for five minutes. If sterilised at a temperature of 225° F. for twenty minutes, both bacteria and their spores are killed, but in this case it is possible that the casein is rendered slightly less digestible, while the condition of the fat globules is changed.

When pure milk enters the stomach it coagulates, forming the jelly-like material which we recognise in junket or in the curd intended for the production of cheese before the whey has left it. This change is due to the rennet ferment, which is practically identical with that obtained from the stomach of the calf. Why

milk is not curdled - we use the word in distinction to coagulation - by the gastric juice is not precisely known, and yet it may be due to the alkalinity of the milk itself. Thus, too, it is probable that milk is better digested by one person than another, owing to the difference in the acidity of the gastric juice. We have remarked that milk is too bulky for large consumption; still more is this the case when, owing to difficulty in its digestion, it becomes essential to dilute it with water, or soda, barley or lime water, all of which have their advantages, but there are few instances in which milk cannot be taken with the addition of one of these particular fluids. Again, the clotting in the stomach which makes milk less digestible may be prevented by employing it in farinaceous puddings, or as bread and milk, or with crushed rusks and breakfast biscuits, thus breaking up the clots and preventing troubles which are difficult to bear. In all cases, however, it will be found that whether milk is consumed alone or in the various ways suggested it should be well mixed with the saliva, and even healthy persons will find this practice advantageous. It has been shown by Weber that milk which has been sterilised is as well digested by infants as new milk, and yet again we would press the importance of supplying infants with milk which has been specially prepared or humanised.

We may assume that the largest quantity of milk is consumed by the rich and middle classes, and very little by the poor. As the poor form a much larger portion of the population, the duty of the milk seller and producer is to enlist them on the side of health and strength. Various crusades are now proceeding with the object of elevating the working classes--why not a milk crusade? For some occult reason the great majority of the poorer people prefer both tea and beer to milk. Tea, especially when stewed and constantly consumed, has ill effects both on digestion and on nerves, but when mixed with milk its baneful influence is diminished. Something will therefore be gained if the poor, who are such large consumers of tea, were induced to imitate their richer neighbours, and to drink it with the addition of milk. The relation of milk to the poor, however, has a much greater significance than this; the children are ill-fed not only in infancy, but when they reach their teens, and it has been shown from time to time, where milk has been added to the daily ration of a poor man's child, the growth is more rapid, the weight increased, the teeth are better, and the health becomes robust. Facts such as these have been ascertained by constant examination of the children attending public schools in several of the northern towns, and we have no hesitation in believing that a pint of milk per day added to the daily ration would prove a most significant addition to the assets of the nation. Nor is milk used to a sufficient extent among the middle classes, whose daily food consists now more than ever of dainty dishes. We are living in an age of luxury, when simple foods are much ignored, with the result that children feed, until they reach an age when common-sense prevails, on ill-assorted food, and when, owing

to the indulgence of their parents or the bad example before them, they are most difficult to please, and thus in early years digestion fails, health suffers, and breakdowns occur, just when the body should be at its best.

A man of average weight (147 lb.), when kept inactive, as when kept in bed, can live, and sometimes put on flesh, on three quarts of average milk per day, this quantity containing 15 oz. of dry solids—fat, sugar, and casein; but if the quantity is increased to four quarts per day, the food consumed is sufficient to enable him to accomplish a good day's work. We at once admit that so large a quantity of fluid would not be suitable as diet for a healthy man; we simply show that the feeding matter present is sufficient for the purpose named. The food consumed by an average man should be equal to 3,500 calories, and such we find in $1\frac{1}{2}$ lb. of bread, $\frac{1}{2}$ lb. of potatoes, $\frac{3}{4}$ lb. of boneless beef, and 3 oz. of butter; but, excepting butter, there is in the other foods not only waste material which cannot be digested, but a large quantity of moisture. As four quarts of milk are equal in caloric value to this ration, for there is no waste, it follows that a man may obtain as much nutrition from the quantity of milk prescribed as from the more substantial ration. Again, it has been shown that in a pint of milk with bread (10 oz.) there was more nutrition than in a restaurant meal consisting of soup and beef, some cabbage, bread and butter, with a cup of coffee containing milk and sugar, which cost just twice the money.

Our desire is to show that milk should form a large part of the diet of the child and a portion of the mixed food of the man and woman. There are tens of thousands who prefer to pay 2d. for a glass of beer than $1\frac{1}{2}$ d. for a pint of milk, and this applies to those who take a "nip" in winter to "keep out the cold" and in summer to slake their thirst. And yet there is no fluid which maintains the body's warmth so well as heated milk; owing to the minute size and distribution of the fat globules, which are non-conductors, it retains its heat longer than any other fluid, while, unlike spirits, it is followed by no reaction.

We are aware that those engaged in the milk industry are averse to sterilising and to bottling milk, and yet with a wide experience of this particular work we have never learned the reason why. Milk which has been sterilised, as we have seen, is easily digested. A bottle opened on the table is as fresh and sweet as when first drawn from the udder of the cow, while the certainty exists as to its freedom from dangerous impurity—a point of some importance. The bottling process, whether milk is sterilised or not, allays the fears of those who doubt, and who, in consequence, are small consumers; it reduces the cost of labour to the retail trader, who, instead of calling on his customers fourteen times a week, need call but once. Other matters *pro* and *con* are of no real importance. It is said from time to time that milk which has been heated acquires a flavour to which most families object; yet this is a strange illusion, for in the majority of cases it is covered

by tea or coffee or by the flavour of other foods prepared with milk's assistance. We might, however, point to the West of England, where all milk is scalded for making butter, and where the skim and butter both possess the scalded flavour, which is regarded as almost ideal by consumers. The time will come when bottles will be filled directly from the cows, passing through the milking machine. The entire system of the milk supply is undergoing change, and it is significant that the action of the British Dairy Farmers' Association in regard to the Butter Bill, and the Central Chamber of Agriculture in their recommendations in relation to general legislation dealing with milk production, have both adopted views which were almost ridiculed not many years ago.

CREAM.

Cream is not only a luxury in consequence of the price it costs, but because it is one of the most delightful of all known foods. There are, however, two conditions in which its superiority is most marked ; first when it is skimmed from a shallow vessel in which it has been raised in a sweet dairy maintained at 60° F. for twelve hours, and next when it is raised upon the West of England system. Those who have lived in the Western Counties, or who have been able to see such a superb dairy as that of Mr. Vosper, at Plympton, near Plymouth, will know precisely what we mean. In these two varieties of cream we get not only the mellowness at its best, but the finest flavour that is possible. In cream extracted from milk by the centrifugal machine the difference is marked, but when it has been preserved by the aid of boracic acid or of other drugs, both its flavour and its character have been destroyed, and it is no longer the same delicious food. Now our object is to show as nearly as possible how the trade in cream can be increased. The more it appeals to the palate, the more likely it is to sell, hence the remarks which have been already made. How, then, can cream be placed upon the general market without being preserved by artificial means ? It is impossible to advocate any practice which places cream upon a level with jam or preserved fruit. We are aware of no method short of preserving by chemical aid which will enable the producer to adopt this plan. It was recently laid down by one of the chief London magistrates, sitting at the Clerkenwell Sessions with a Bench of Justices, "that as cream now formed part of the ordinary diet of children the supply of that which is mixed with boracic acid must be taken as within the section," and therefore appeal against conviction was dismissed with costs. The Bench was willing to state a case upon a point of law subject to the finding of the fact that cream now formed part of the recognised diet of children. It was subsequently stated that the sale of cream without preservatives would be almost impossible. We have known Devonshire cream to be sent to London and retailed for 40 years without preservatives ; while fresh cream, newly skimmed, cooled and bottled, can be retailed by members of the dairy trade, as they

are well aware, in fine condition and improved consistency to meet all the requirements of the consumer. That by the prohibition of the sale of preserved cream the industry of a few may be affected there can be little doubt, for instead of large consignments to distant traders being occasional they must be made from day to day. Hence the fact that just as the farmer consigns his milk daily to the trader, so will it be with regard to the sale of cream. The thing is in a nutshell—if cream preserved and potted is fair to the consumer, why not preserved and bottled milk?

In cream a large proportion of the water of the milk has been replaced by fat, the relative proportions of sugar and casein being very similar to that in milk. Cream may contain from 20 to 60 per cent. of fat. There is no standard, hence the buyer is largely at the mercy of the seller. Good cream contains from 45 to 50 per cent. of fat, and should not fall below 45 per cent. Clotted cream will keep longer than raw cream, and for two reasons. It has been subjected to a high temperature, by which the bacteria were chiefly destroyed, while owing to the smaller quantity of sugar which it contains there is a smaller production of lactic acid after keeping. The contention of the writer is that cream should be as popular as milk, and relatively speaking quite as cheap. It should form part of the diet of the weak and those who need this form of sustenance, apart from which it should be placed upon the table, not only as a luxury, but as a food of the great bulk of the people. This may be regarded as a somewhat wild suggestion, but those who have lived in the West of England, in Devon and Cornwall in particular, are well aware that it is not only a common article of diet among the middle classes, but is almost general upon the tables of the artisan and the well-paid working people. Let us see whether cost should bar the way.

At the present time it is quite common to charge at the rate of 4s. per quart for average cream fresh from day to day. If we remove cream from milk at the rate of 10 per cent. when milk costs 8d. per gallon wholesale price, we get one gallon of cream at a cost of 6s. 8d. without the cost of labour, or 2½d. per quarter pint. Thus the churn stands at 1s. 8d. per quart against 4s., the skim milk paying for the labour. If to this price we add 50 per cent. to represent the cost of carriage and the profit, the cream costs 2s. 6d. per quart, or 7½d. per half pint, a figure which, if it proves anything at all, shows that it is within the reach of tens of thousands of families who never use it. Rich cream produces butter at the rate of 1¼ lbs. to 1½ lbs. per quart. In 100 lbs. of milk containing 4 per cent. of fat the butter produced is equal to 4½ lbs. This will give to the reader some idea of the food value of half-a-pint of rich cream which would contain over 4 oz. of butter. If an article of food is to be made popular it must be sold at a popular price, and prove sufficiently palatable to induce the buyer to come again.

THE REARING OF SPRING CHICKENS AND PREPARING FOR MARKET:

SIMPLE METHODS FOR THE FARMER.

By S. C. SHARPE, Agricultural College, Uckfield; Poultry Expert,
and Lecturer under the East Sussex County Council.

In this article I propose to deal with simple inexpensive methods of rearing early spring chickens. We well know that anyone can rear chickens in the summer months, but it is comparatively few farmers who have chickens to put on the market at the time they command the best prices. In these notes it will be my endeavour to explain how a farmer may, if he chooses, have chickens for sale during the months of March and April.

I have heard it said that early hatched chickens are so much trouble that the cost of rearing is more than the birds are worth when marketed, but I think I shall be able to disprove this mistaken idea.

We hear of the Cottager being able to make his poultry profitable, but it is a branch of farming which the farmer often neglects, not that he keeps no fowls, for as a matter of fact he often keeps too many, or, rather, that he keeps more than are properly attended to. He has a few hens put down on eggs when they become broody, and owing to defective sitting-boxes (if any be used at all) the rats take away some of the eggs and spoil the others, the whole batch often ending in a failure. This kind of thing often happens, and it takes away what little energy and interest the poultry-man or woman may have in the work. Now, one must not go about the rearing of chickens in this way; there must be just the same system as with the dairy or sheep on the farm.

Breeds.—I will deal first with the breeds most suitable for the purpose of rearing market chickens. I shall not touch the question of egg-production, as I contend that is quite a separate branch of poultry keeping, and the rearing of chickens pay much better if worked upon business lines. A class of fowl must be kept which has sitting proclivities, a bird which is broad and deep and of large frame, for without large frame we cannot get sufficient flesh upon the bird in a short time. The breed must also be noted for quick growth. Now, here is a great point, and one which is often overlooked by many poultry-keepers when making a start. It does not so much matter about the colour of the bird, we must have something

strong and sturdy, which grows fast, and will be ready for killing at the age of fourteen or fifteen weeks.

A Breed of Quick Growth.—One of the best for the purpose is the Sussex, either the Light, Red, or Speckled, the former, in my opinion, being the quickest to come to maturity, and being white in leg they make such excellent table fowls. There are *some* breeds of the Yellow-leg varieties which grow fast, but one must not breed yellow-legged birds for market. They will not command the prices that can be obtained for the white-fleshed fowl. Yellow legs denote yellow flesh, and such birds never sell well. The Sussex is a good sitter and mother, will bring up large broods of chickens in the cold months, and therefore is well adapted for rearing early chickens by natural means. They are also excellent winter layers, and here again is a point we must not forget, for without eggs we cannot hatch chickens. The texture of the flesh is good and fine in quality, closely resembling the Old English Game, and of which there is some of the blood of this last-named breed. The chickens are very hardy, and if the stock is healthy and in good condition the chicks will give very little trouble, even when rearing in bad weather. I could not recommend this breed to be crossed with Game, for during the past year I have noted from experiments which I have carried out in this direction that by introducing Game we check the quick growth of the chickens, although when grown they make fine table birds. There seems to be enough Game blood in them already, and by adding more the usefulness of the breed seems to be decreased.

Improving a Flock at Small Cost.—Should a farmer have a flock of fowls on the farm of several different breeds, he may, with very little cost or trouble, improve their table qualities in the following way: Should there be Leghorns or Minorcas, or, in fact, any light or non-sitting variety, these must be taken away, leaving only the heavy breeds; there may be Rocks, Buff Orpingtons, or Wyandottes left. Now, two of these have yellow legs, therefore we must not mate a cockerel of the same class with them, but a good, strong, well-grown Sussex cockerel may be turned down, with the result that some nice table chickens can be hatched and reared, and by saving the pullets, which can be mated another year with Sussex again, the flock will be improved, and a good, useful strain of table chickens secured at a trifling cost.

Dorking and Buff Orpington.—This is a very useful cross for table purposes, although the chickens are not quite so fast of growth as the Sussex, but they are broad and deep of breast, and make very good birds for fattening, the flesh being of good flavour and very white. Here again one's fowls may be improved by mating a flock of Buffs (selecting the largest hens) with a large, deep-breasted Dorking, the pullets being saved and mated the next year with a large-bodied Buff Orpington cock. The Orpington is a good breed of fowl, but the chickens are not so well adapted for table purposes as those which I have previously mentioned:

they cannot be brought on so fast, but they feather quickly, and this makes them hardy for winter rearing.

Indian Game—Faverolle.—Here we have a good class of chicken, but I have found a difficulty in getting eggs in winter from this cross. If the hens can be forced on to lay, these chickens will be found very useful for table purposes. They carry a good amount of breast flesh, which is generally white in colour, a few coming with yellow legs, but in this case it does not seem to affect the colour of the flesh much. They are hardy, and easy to rear.

Indian Game—Dorking.—One of the best for table use, but cannot be recommended for early spring chickens. They are not good winter layers, and the chickens are somewhat difficult to rear in the cold months of the year, especially if the soil is inclined to be wet. For own private use they are excellent, and require no artificial feeding, being somewhat like ducklings—fattening as they grow.

I should like to mention, before going further, that before mating *any* breed they should be overhauled, to see if they are in sound, healthy condition; for should there be any weakness in either the hens or the cocks, it will make the work of rearing the chickens so much harder, besides giving the chance of heavy mortality amongst them. This, perhaps, applies even more especially to the male bird. A cock or cockerel with crooked breast should never be used for mating, neither should the bird be too long in leg, and he must not be related to the hens; the latter weakens vitality, and throws the progeny open to all kinds of disease. All these items, when mating, go towards ease and success when rearing, and there would not be one-half the loss amongst young chickens when rearing if more care were taken in the selection of the birds for mating.

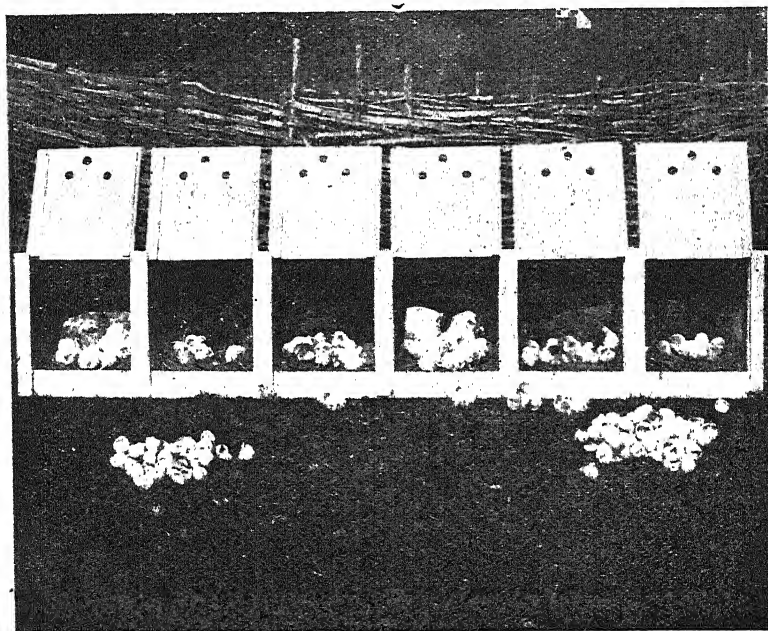
Age of Birds for Mating.—If using two-year-old hens (and this is the best age), a year-old male bird can be run with them—a bird which has been hatched early in the season. Late-hatched cockerels do not grow so quickly, and therefore are not so suitable for mating for production of table chickens. Should pullets be used, a two-year-old cock can be placed with them, but it is not right to breed from young pullets, as the chickens are liable to be delicate when hatched.

Best Means of Hatching.—There are two methods of hatching chickens: artificial and natural. In these days of incubators, one does not have to wait for the hens to become broody; eggs may be put down as soon as they are collected from the nest. As to which is really the best method, I consider the natural way to be the best and cheapest; but one cannot always have sufficient hens to go on this plan alone, and therefore must have an incubator to do the work. Perhaps the best system is to use both hens and incubators, starting the machine at the same time the hens are put down. Large batches may then be hatched out at one time, and thus greatly facilitate the work of rearing; but when this is done some of the eggs have to be kept for a few weeks.

Eggs for Hatching.—Although eggs are better when put down fresh, yet they will keep well for three or four weeks before putting in incubator or under hens. We only have to take the example, for instance, of a hen which steals her nest away in a hedge-row. She will generally have a good batch of chickens—probably 18 or more eggs being laid—yet, providing she is not troubled or disturbed by foxes or rats, etc., she will hatch all the eggs, the chicks all coming out about the same time, although some of the eggs must have been laid nearly three weeks before the hen started to incubate them. We may rest assured that eggs may be kept for a good period and still find the fertility in sound condition. If they are being kept for hatching purposes, it is well to turn them once a day, just moving the egg. There is no necessity to turn it right upside down.

Hatching with Hens.—I will deal with the natural means of hatching first. There are no means of making a hen become broody, but the broody fever may be hurried on by leaving eggs in the nest. I do not mean by this that the eggs should not be collected, for this is most important, but dummy eggs may be used for this purpose, and the hen becomes more inclined to sit, especially if the nest is in a darkened part of the house or shed.

Sitting Boxes.—These should be ready. The illustration will



HATCHING OR SITTING BOX.

give one a good idea of a useful and cheap kind of sitting-box. It is made for outside use, and can be used out of doors in any kind of weather. If, however, one has a shed at disposal, it makes the work better when taking the hens off for feeding. The inside measurement of the box is 15 inches, being 18 inches high at the front and 16 inches at the back. All sitting boxes should have plenty of ventilation, for a hen cannot bring off a good strong hatch if she has to sit in a stuffy badly ventilated place. The boxes should be lime-washed after every hatch, using some carbolic acid in the wash, and putting it on quite hot; this will kill all insect life there may be about.

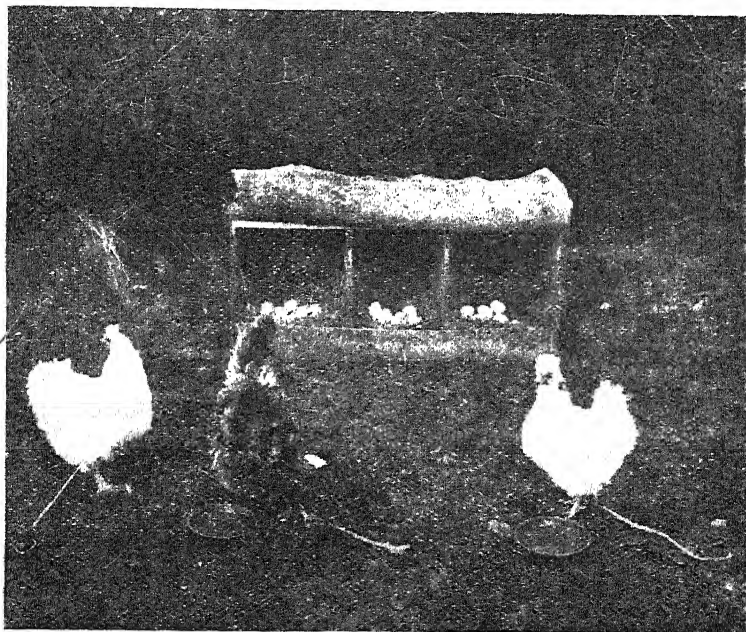
Making the Nest.—This is an important item with regard to hatching. If the nest is rightly made, there will be very few eggs broken during the hatch. Few poultry-keepers know how to make up a nest properly; if they know, it is certainly very seldom they use their knowledge in this direction. It is often written that a hen should only have about nine or ten eggs placed under her in the winter months, but this is quite misleading, for if the nest is made as I shall describe, it is possible for a medium-sized hen to hatch 15 eggs at any season of the year. First, a good large hole should be scooped out in the ground (all sitting-boxes should be made without floors, and placed upon the ground). Make the hole fairly hollow in the centre, seeing that there are no hard lumps of earth or stone left in the bottom, for should this be so it may cause broken eggs; then procure some fine sweet hay, making a thick band to put around the top of the nest. Next fill in the bottom part with loose hay, and the nest is complete. It should be hollow like a basin when finished; in this way the eggs cannot roll away from under the hen, and *chilling*, which is often the cause of addled eggs is prevented.

Disinfecting the Nest.—Before putting the eggs into the nest it should be disinfected, using the following powder, which is cheap, easily made, and effective:— $\frac{1}{2}$ gallon flowers of sulphur, 1 quart slaked or powdered lime; mix well together, and then add $\frac{1}{4}$ pint of carbolic acid; mix again, and keep in a tin in a dry place. Sprinkle a little of this powder in the nest.

Hens not Sitting Well.—This is often caused by the hens being infested with Red Mite or other vermin. The hens probably sit very well for a few days, and then on going to the nest one finds several eggs broken and the nest scratched up, the whole batch being frequently spoiled. To prevent this when hatching with hens, they should be given a good dusting with the above powder a day or so before they are put down upon eggs.

Selecting the Eggs.—The eggs should be fairly even in size, not too large or small. It is generally useless to choose very large eggs for hatching; they seldom turn out well, and it is a waste to put them down. A thin-shelled egg should never be set, nor one which is bad in shape, for if they hatch at all, they will generally bring out crippled chickens, which it would be impossible to rear.

Feeding the Hen.—When everything is in readiness the hen should be put on the nest—I should say *hens*, for at all times it is well to sit two or three hens at once. The hen must be properly managed if a good hatch is expected. She should be taken off the nest *once* a day, and this at a regular time. The hens may be placed in a crate to be fed, or tethered by the leg, as shown in the illustration. The latter is a very simple way of feeding them, and



HENS TETHERED BY THE LEG.

there is no difficulty in putting each hen back upon her right nest again; and this is of course essential, for the hens differ in bodily heat, therefore it would make some difference to the hatching if they go back to a different nest. They can be left off the nest about 15 to 30 minutes, according to the weather. All nests should be looked to in the meantime, and any cracked or broken eggs be taken out; any foul nests be cleaned out, and eggs washed. Hens must be well fed, maize being a good grain to use in winter, as it is strong in carbo-hydrates, and therefore assists to keep up bodily heat. Wheat may be given as a change, also barley occasionally; water must be put down for them to drink, and a little flint grit provided; they will require grit if they are fed all the time upon a grain diet, and this is preferable to giving soft food, as they only have the one feed a day it is not so easily assimilated, and will last them longer than soft diet.

Testing the Eggs.—It is advisable to test all eggs in the early part of the season, because generally one finds rather a larger number to be infertile in the colder weather. The process is quite simple, and occupies very little time. Take a candle or lamp in a darkened room, holding the egg in the hand so that a portion may be seen opposite the light. If the egg is fertile there will be seen a dark spot floating towards the centre or top, somewhat resembling a spider, when infertile it will be seen quite clear, like a fresh egg. An addled egg has quite a clouded appearance, no germ being seen at all. A white-shelled egg is the easiest to test, the shell being more transparent, and beginners should start with these. Eggs may be tested four days after being put under the hen or in the incubator, but the seventh day after putting down is the best, the germ being seen at a glance.

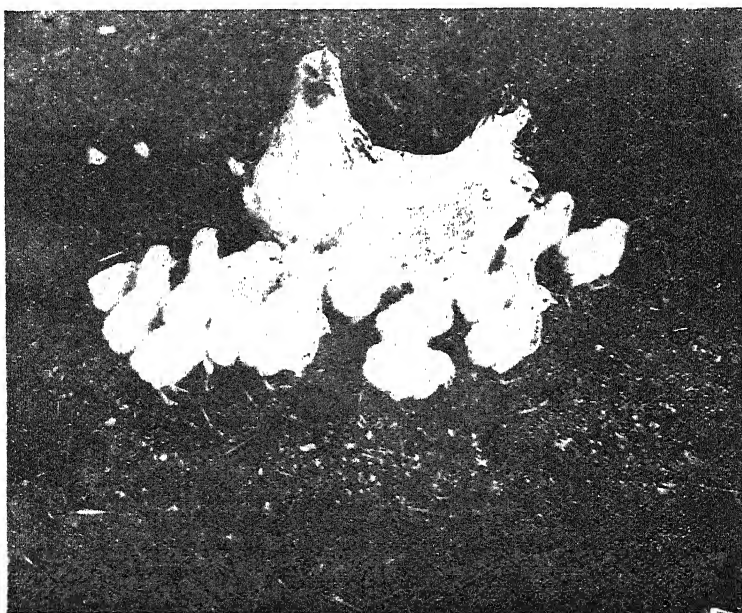
One Cause of Addled Eggs.—This may be due to one of many causes. But one which many farmers would never think of, and yet which is often the case, is *not* collecting the eggs *every day*. If the eggs are left in the nest, and a hen becomes broody, and sits upon them all night and part of the next day, that heat is sufficient to start the embryo. The egg may be left several days, or a week, before being put under the broody hen, when it becomes addled, for germination having being arrested and stopped it will never start again.

Hatching Off.—If the hen sits well, she should hatch off on the 20th or 21st day. If she has not kept well down upon the eggs she may be a day or even two days later before bringing the hatch off; this generally means weakly chickens, and a late hatching is always more difficult to bring up. It is not advisable to disturb the hen when hatching; she need not be taken off for food the last day. It is not so much that the eggs or young chicks get cold, this will not hurt them, but it stops the moisture under the hen which is so much needed to bring off a successful hatch. Therefore she should be left alone until all, or nearly all, the chickens are out. Should one or two eggs be left in the nest when the hen has finished, they can be taken out and placed in the incubator or under another hen. The chickens should be taken out of the nest when dried off, giving the hen a good feed of soft food in the meantime, and placed into a well-made coop. Before going on to the management of the chickens, I want to touch on the subject of incubation by artificial means.

Incubators.—There are two kinds of incubators, viz., moisture and non-moisture machines. The former seem to work better in England, although there are some poultry-keepers who use the hot-air or non-moisture machines with success. There are several good makes of both kinds on the market, many of them being very cheap. I need say little as to the working of them, as generally the full directions are sent out with each one, and I can only add that it is wise for those who work the incubators to follow out the directions of the maker as nearly as possible, for he has generally found by

trials the best way of working his particular machine. I might add that when hatching with incubators the eggs should be well cooled twice a day. I think people would more frequently have good results if they gave more attention to the cooling of the egg-drawer; also the drawer should *not be* taken out after the 19th day of incubation-until the hatch is well forward, for if the moisture is lost during the chipping period many of the chickens will be found dead in the shell. When putting the chickens into the drying box at the top of the machine there should be fresh air admitted, or the young chicks become over-heated, and will be subject to taking cold, or even pneumonia, when placed out in the coop or foster. After every hatch the incubator should be thoroughly cleaned out.

Rearing the Chickens.—The chickens may be reared on either system—that is, by hen or foster. Here, again, I like the natural means best; it is far cheaper, and much easier where a number of hens are kept, the incubator may be used to hatch chickens to make up the broods with the hens. If they are put down at the same time the hen will take the chickens quite well, and very large broods can be brought up with each hen. Taking the natural means first, a most important point is to have good well-constructed coops, provided with a floor and a front shutter, made with wire netting ventilator. Then, if large broods are placed in



LARGE BROOD REARED BY HEN.

the coop they can get that so much needed fresh air, without which they cannot be made to grow fast. The aim from the first must be to get the chickens ready for market at the earliest possible date. The floor of the coop should be made to fix in loosely and easily, so that it may be taken out without much trouble for cleaning. Before the hen is put into the coop a good quantity of litter in the form of chaff or peat moss must be placed upon the floor, and this should be cleaned off two or three times a week—rather more if the weather is very wet. If any harm is ever caused by using boarded floors in coops it is done by not putting down sufficient litter. The coop must be placed with *back* to the wind, and a dry sheltered field should, if possible, be selected for rearing. On rather bleak places, a hurdle thatched with straw or gorse, and stood beside the coop, forms a good shelter for the young chicks; cold winds are bad for them, and will check growth very much, but if an artificial shelter is put up, it saves the birds from the cold biting winds.

Water for Chickens.—They are better without this in winter and spring; if they are fed on soft food, they get sufficient moisture from the food. If water is ever given it must be fresh, and put into clean vessels; also there should be a constant supply before the chicks, otherwise they will take too much at one time, and so do harm. Where milk can be procured it is an excellent thing to use, both as a drink and to mix with the food; this would be too expensive to buy, but can often be used on the farm instead of all being given to the pigs.

Care of the Hen with the Brood.—It is often noticed that some broods thrive and get on much better than others, yet all are being fed and managed in the same way. This many times is due to lice getting from the hen on to the head of the chick, and when a brood is noticed to be failing somewhat they should be examined, and a little carbolic vaseline put upon the head and under the wings of the chick. If any lice are found, the hen should also be dusted with insect powder, one does not get this trouble so much in the cold months as in summer. The hen must be well fed during the time she is bringing up her brood. Never feed the chicks without giving the hen some of the food. Put the food, or at least some of it, where the hen may be able to clear up what the chickens leave. By doing this it saves the chickens from being over-fed, and also from the food getting stale and bad, which it soon will do if left upon the ground. Never feed the chickens upon old sacks or boards. These get dirty, and will soon cause diarrhœa amongst the birds; chickens are prone to this complaint, and it may often be traced to giving them food which is sour and stale. A little chopped onion and green food will put them right quickly; but if they get a bad attack, rice, damped with water, and a little powdered chalk put upon it, may be given with good results.

Times of Feeding.—Young chickens in the early part of the year should be fed little and often. There is no hard and fast rule to be laid down. Some may feed them every two hours, but chickens

that are strongly hatched and are being reared with good hens, if fed five times a day should grow and do well.

Foods to Use.—Hard-boiled egg and biscuit meal is the best thing to start them upon, using the infertile eggs—or the eggs may be beaten up with milk into a custard and given with biscuit meal and ground oats. After the first three days ground oats should form the staple diet. Dry feed (a mixture of grain sold by this name) may be given once a day: this grain to be used at evening for the last feed. Chickens which are being grown for market should not be entirely fed on dry food; they will not put on flesh so rapidly, neither will that flesh be so soft and white as when they have ground meal. Meat in some form is excellent to use with the meal for growing chicks; it should be first scalded, and then mixed with the ground oats. Grit must never be omitted. The young birds will eat a quantity of this, it is cheap, and will keep their digestive organs right if plenty be given. It should not be mixed in the soft food, or too much may be given in this way, but it can be placed in boxes or small vessels, where the birds can help themselves when they require it.

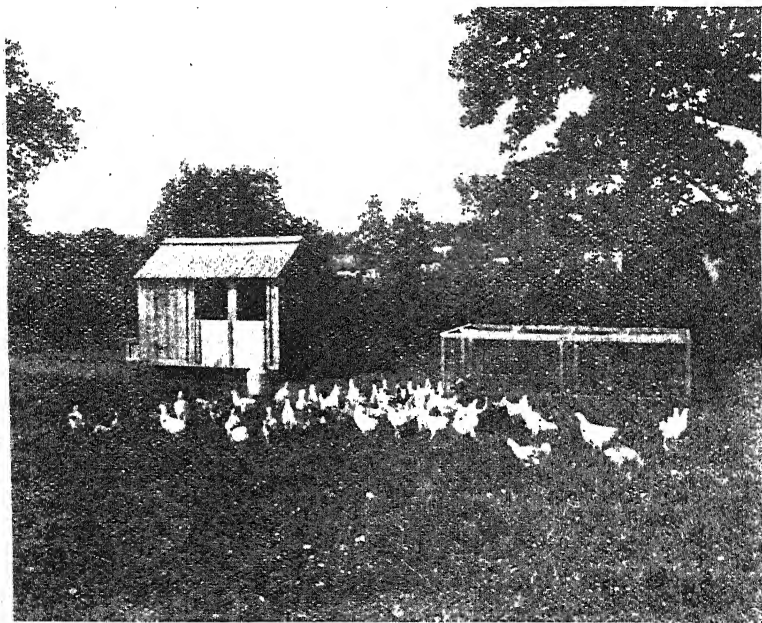
Leg Weakness.—This complaint, or what many call *cramp*, is often due to insufficient bone-forming matter. The birds having nitrogenous food form flesh faster than bone. A batch of chicks which are found to be suffering from this complaint may be put right in a few days by using a little bone-meal in the soft food twice a day. This can be bought at 7s. 6d. per cwt.—at least that is all I have to pay for it—and it is an excellent food-stuff to have in stock to use in case of an outbreak of leg weakness. It may be given say two or three times a week as a preventive, and will do the birds good. One finds that the complaint attacks chickens more particularly when they are growing fast, about eight to ten weeks old.

Maize for Table Chickens.—This much-abused grain may be given with safety to growing chickens. Too much should not be used, as it will cause the flesh to be somewhat yellow; but if used in conjunction with ground oats, when cracked or kibbled and boiled in milk, it forms an excellent article of diet. Sometimes it can be boiled in the broth in which meat has been cooked: it is very useful in this way for feeding, and much relished by the birds. If the diet can be changed often it is much better for the health of the chicks, and they will not be likely to lose appetite. After they get six or seven weeks old, larger quantities of meat and vegetable may be given. One must study the cost of the food bill closely, for unless this is done the birds will cost too much to rear. Pollards and thirds, with ground oats, maize, and meat, will form the chief articles of diet at this age. They must be well fed, but there should never be any food left upon the ground. They will put on flesh more rapidly if kept a little hungry sometimes rather than be overfed.

Artificial Rearing.—When a large number of chickens are being reared, foster mothers must be brought into play. I do not advocate the use of them so much if one has plenty of hens to do

the work, but such is not always the case, and then the artificial method is a great help to increase the number of chickens. I must especially mention one or two points in connection with the working of fosters. There are some very useful and cheap ones on the market, most of them working quite easily; but whatever kind of foster be used, one must see that there is an abundance of fresh air admitted both day and night. Every day when fine the whole of the foster should be opened up for 15 to 30 minutes, so that it may be thoroughly cleansed of all bad fumes, etc. The chief reason that some poultry-keepers find it difficult to rear chickens without heavy losses in foster-mothers is due to over-heating and *coddling* the chicks too much; they should be brought out of the bed or heating chamber as soon as they can, and the heat of the foster must be reduced gradually from the commencement. The foster must be frequently cleaned out, and after *each* hatch should be well limewashed inside, using plenty of carbolic acid in the wash. All these little things have to be attended to if one really means to be successful with artificial rearing. The fosters, like the coops, should often be moved on to fresh ground, and as the birds get older this must be done more frequently, for they very soon make the ground tainted and stale running about around a foster.

Houses for Growing Chickens.—When the chicks are eight



A GOOD HOUSE FOR A BATCH OF CHICKENS.

to ten weeks old they must be taken from the hen or foster and placed into houses, which, by the way, should have no perches—it is a mistake to let chickens roost when too young. They must not be placed too thickly in the houses, and, when possible, all chicken-houses should be placed in the most sheltered part of the field, on to fresh ground if it can be spared. If they are to be crammed before killing, they can be picked up for the fattening crate at about the age of twelve weeks, then by good feeding for 14 to 20 days they will be ready for market.

Preparing for Market.—When it is possible this should be done by the cramming machine, an illustration of which is shown.



CRAMMING MACHINE.

It is quite a simple process, and with a little practice a lad or poultry-man will soon become proficient. I have just had a pair of Sussex chickens, 18½ weeks old, fattened and sent to the Smithfield Show, which weighed 21 lbs. 6 ozs. ; a pair of pullets, 17 weeks old, weighed 19 lbs. 13 ozs. These birds had been crammed with the machine,

and the food used was ground oats, melted mutton-fat, and condensed milk, this last-named being used because we had insufficient skim-milk. The condensed can be bought for *less* than 1d. per tin, and one tin will make a gallon of good milk for cramming. This has been largely used by fatteners in the district for some time: they find it is cheap and good for their purpose. The birds should be put up into coops or crates such as are here shown. The crates



COOPS OR CRATES FOR FATTENING.

may be placed out of doors in the spring and summer, but for winter fattening I prefer to have them inside, as a certain amount of heat is necessary to enable them to put on flesh. The crates are made with staves or bars at the bottom, so that the droppings fall through, and there is no cleaning out to be done. For the first nine days the food should be placed in the trough which is hung along the front of the crates, the birds putting their head between the bars to get the food. This is made up with ground oats mixed with milk; it is best for the milk to be in a sour state, as it is then an aid to digestion. The food should be made sloppy like pigs' foods, and when the birds have had sufficient the trough may be taken away, another lot being given at night (they only require two feeds a day). After the 9th or 10th day the cramming machine comes into use. The food may now be mixed, having some melted mutton-fat in it, the birds being crammed twice a day until fit to kill, which, in the

spring, will be in a few days or a week. The cramming puts the finishing touch to them, and makes the flesh of a more juicy flavour and white in appearance. Before killing, the birds should be fasted for 24 hours or longer until every particle of food is out of them. This increases the whiteness of the flesh and improves them considerably. Many of the birds that are put on the London markets have not been fasted a sufficiently long time, hence the unsightly red appearance they have. This redness is also sometimes caused by the birds being put on too strong food at first, it overheats the blood, and they never look well when killed. Another strong point which must not be overlooked when putting the birds on the market is *not to pack before quite cold*. Money is often lost by the fattener in this way, more particularly in the summer time. The birds go green in the intestines, which shows through the side and back part of the fowl, with the result that they are sold for much less than their real value.

Packing.—The peds that are used in this county are excellent for dispatch, and can be bought in different sizes holding one, two, and three dozen chickens, or more. Clean straw must be used to pack the birds in, with a good covering of paper and straw on the top before the lid is tied down.

I may add, in conclusion, that where a farmer could not employ a man to do the cramming of his chickens, he can make them up into quite good condition by trough feeding alone, but they will only feed well for the few days I have mentioned, and must be killed then or they will soon lose flesh. Therefore, when the crammer can be brought into use it puts on the finishing touch, and makes the bird of much more value from a market point of view.

THE KENT AND SUSSEX DAIRY CONFERENCE.

The Dairy Conference and Excursions of 1907 were fixed to be held in Kent and Sussex. No happier choice could have been made, and the members who assembled to the number of about ninety, were well pleased with their visit. Arriving at Tunbridge Wells on the evening of Monday, June 10th, they attended a Reception in the Town Hall given by the Mayor (Alderman B. M. Woollan, J.P.). The next morning they were present at a Conference in the same building, under the presidency of Lord Kenyon.

In his opening remarks the President, having acknowledged the warm welcome extended to the Association, said that no less than twenty counties were represented at that Conference that morning, not only English counties, but also Scotland and the Channel Islands, and his lordship hoped that that meeting and subsequent meetings and outings would be a success. He was sure that at the end of the week they would all take back pleasant remembrances of the beautiful county they were visiting.

Professor T. Carroll (of Dublin) was then called upon to read the following paper :—

DAIRYING IN RELATION TO SMALL FARMS.

By Professor T. CARROLL, Dublin.

I fear that I have been guilty of an indiscretion in agreeing to read a paper before this meeting, and I can only rely upon your generosity to overlook the defects of my contribution, and by a lively discussion to draw away attention from such a feeble attempt to deal with a subject that at the present moment has large interests for agriculture in the United Kingdom.

The much discussed question of "small holdings" appears to be approaching finality. Whether this finality will be a successful one, or one that will disappoint its most ardent advocates, is a matter that can be decided by experience alone.

It is now nearly forty years since England was troubled with discussions on a question that is a burning one at the present moment. The late Mr. James Howard, of Bedford, after some Continental trips, gave, in a paper read by him before the Central Farmers' Club, London, his views on the small farming systems that he had examined during his travels. On the whole, his views were entirely adverse to the introduction to England of Continental methods of *petite culture*.

The publication of a report upon the Agriculture of Belgium, made by the late Mr. H. M. Jenkins and Dr. A. Voelcker, to the Royal Agricultural Society of England appeared to fortify Mr. Howard in his views, namely, "That a full comprehension of the difference in the results between stock farming and *petite culture* should be arrived at. We can draw our supplies from the ends of the earth, but until nature yields up her secret as to the means of preserving meat fresh for an infinite period, the area from which we can draw our supplies of animal food will be circumscribed. Having well considered the subject, I am forced to the conclusion that were *petite culture* to become general in England, as in France and Belgium, with our teeming population wheat would soon be at famine prices."

I must add the patriotic conclusion of Mr. Howard's address: "I have yet to see the country which can compare in agriculture with our own beautiful little island."

The assumption of Mr. Howard has, however, been falsified by facts. Nature has yielded up her secret of preserving meat and other animal products. The area from which we can draw our supplies has become at this time almost boundless. The consuming powers of the masses has been increased in Great Britain through alteration in economic conditions. Manufactures and industries have increased. Organisations have favoured a distribution of money amongst the wage-earning classes. The standard of living is consequently raised, and what may be called the finer products of agriculture have an increasing demand, so that the forebodings of Mr. Howard have been completely ignored in the evolution of altered and possibly improved conditions that are now available in agricultural life.

It would not be proper, nor possibly prudent, for me on the present occasion to enter the arena of discussion as to whether the multiplication of small farms should be encouraged in the United Kingdom. As a rule, such matters may be left to settle themselves, which they generally do according to the inflexible rule of economic law. The *role* of the agriculturist would appear to be that of suiting his work to the occasion, and providing for the market such matters as can be produced to the greatest profit.

I have no doubt that those whom I have the privilege of addressing have kept themselves well informed upon a question that has such important interests for the country. I will, therefore, confine my remarks to the relation that may exist between dairying and small farms. In dealing with the subject, I shall ask you to allow me to include products of the farm that are themselves dependent largely upon dairying on farms.

What is a "small farm" is a question that requires definiteness in order that it may be answered satisfactorily. As it stands, it does not appear to have a sufficiently clear indication of what it requires for elucidation. Districts have special conditions which influence the comparative size of farms, and as to what should be

the extent of an economic holding, the social condition and the ideals in the matter of food, clothing, etc., of the people, are all necessary for consideration when dealing with this question.

It is generally conceded that in the vicinity of towns, and especially near those towns in which a large number of persons earn regularly moderate wages, the multiplication of small farms would appear to be desirable. And it is in such districts that systems of dairying and kindred agricultural industries suited to *petite culture* might be expected to succeed.

It would be difficult to fix a standard for the extent of such farms. It may, however, be considered that in the great extension of the small farm system there should be a gradation in their extent, mainly, in the first place, for the purpose of providing means for variety in cultivation—the smaller areas being worked on a system of cultivation of the finer vegetables, the larger areas being devoted to such production as require more extensive plant for production purposes or for numbers of animals necessary to suit the requirements of the districts in which they are situated. Again, a gradation of extent in small farms will afford an opportunity of progress from the smaller to the larger holdings, according as the occupiers acquire means for the improvement of their positions.

To return to our question of dairying. It appears to me that all of the products of the dairy may be reckoned upon from the small farms. The selling of milk, to the manufacturing of the finest varieties of the valuable “soft cheeses,” may all find places upon small farms.

The production of high-class pork and poultry has long had an alliance with dairy farming. In these an excellent means for the useful disposal of the bye-products of the dairy exists; or, should there be a surplus above market requirements, here will be found an opening for its use.

As to what may be realised from such small farms upon which at present dairy products form the staple output, I will (at the risk of the suggestion: Can anything good come out of Ireland?) give a few authentic accounts of receipts and expenditure on farms in places in which the conditions for dairying were of the ordinary character of agricultural districts.

A—B— has a farm of eleven statute acres. Three cows are generally kept upon it. Their calves are reared, and a considerable quantity of milk is consumed by them. Two sows for breeding purposes are kept, and these, with their progeny, consume the skim-milk and buttermilk. Young pigs are sold, and several are fattened either for sale as pork or for bacon-curing. A portion of the butter produced is consumed by the farmer's family; the surplus is sold. Considering the area of this farm, the receipts from poultry appear to be large. This branch is most carefully looked after and intelligently managed by one of the daughters in the family. The farm is not credited with the amount of produce, such as milk, butter, potatoes, etc., that were consumed at home,

my object in abstracting the items of expenditure and receipts being to ascertain what was the surplus cash on the farm transactions.

FARM RECEIPTS.

October 1st, 1905, to 30th September, 1906.

				£	s.	d.
Butter	..	..	..	..	4	11 1½
Poultry and eggs	..	..	..	..	28	18 3½
Pigs	..	..	..	..	35	0 10
Cattle—yearlings reared on farm	..	..	..	..	23	15 0
Lamb	..	..	..	..	2	0 0
Grass seed	..	..	..	..	5	5 0
Miscellaneous :—						
Farm prizes	..	..	£5	3	0	
Egg station	..	..	5	0	0	
					10	3 0
					£109	13 3

PAYMENTS.

For same period, including farm expenses, labour, house provisions, rent, rates and taxes, etc. .. .. .	..	..	79	16	5
Surplus receipts over expenditure .. .. .	..	..	£20	16	10

J. O'H. has a farm of 42 acres, which may be looked upon as a typical Irish dairy farm of the smaller class, upon which butter is made or the milk is sold to a creamery.

The past year's records (1906) showed the following :—9 cows, 2 brood sows, 1 horse, and about 100 fowls, 3 geese, and 12 ducks are kept.

			£	s.	d.
Receipts for milk sold to creamery	..	..	72	0	0
Pigs sold .. .. .	..	..	42	0	0
Eggs and poultry .. .. .	..	..	50	0	0
Corn sold .. .. .	..	..	30	0	0
			£194	0	0
Outgoings :—					
Rent and rates .. .. .	..	£36	4	0	
Labour, seeds, etc. .. .. .	..	46	10	0	
House provisions .. .. .	..	50	0	0	
				132	14
					0
Surplus .. .. .	..	£61	6	0	

Here also the farm is not credited with produce consumed by the family, nor debited with the labour of farmer and his family.

It may be interesting to note that on this farm the rent has been reduced to two-thirds its original amount by reason of the operation of the land purchase Acts.

As an instance of the results of intensive cultivation, where the quality of the soil and proximity to markets made it an exceptional

case, the spade-labour farm of the Albert Agricultural Institution was a striking illustration of what might be produced from land upon which all the conditions for success were present. I give here a copy of a balance sheet which affords a fair average of the expenses and receipts of a small farm (4½ acres) for several years.

THE ALBERT SPADE LABOUR FARM.

Balance Sheet for Twelve Months ended 31st March, 1899.

EXPENSES.			RECEIPTS.		
	£	s. d.		£	s. d.
To amount of Valuation at commencement of year	106	1 0	By Amount received for dairy produce ..	107	3 7
To live stock purchased	24	10 0	By cattle sold	20	11 9
To labour	16	18 7	By pigs sold	22	0 0
To farm seeds	2	3 6	By oats sold	12	6 6
To manures	2	19 0	By potatoes sold	4	1 2
To rent	19	16 3	By mangels sold	12	0 0
To fuel for cooking	2	0 0	By amount of valuation at close of year ..	111	18 6
To labour, etc., from large farm	27	9 5			
To expenses in connection with delivery of milk	3	3 7			
To balance in favour of management	85	0 2			
Total	£290	1 6	Total	£290	1 6

It is, however, on the very small holdings that I found the comparatively surprising results of intense cultivation and careful management.

The growing demand for poultry and their products will largely account for this. Pigs, too, during recent years have very considerably helped the small farmer. In both of these products there is much room for improvements, and considerable possibilities of increased revenue in the future. Eggs, if they are to be in their prime, must be "fresh laid." Pork of high quality cannot, as a rule, be produced in *grande culture*. "Dairy-fed" pork is always marketable, and is absolutely necessary to put it fresh upon the market. The cold storage or refrigeration of pork does not improve its quality.

As an instance of results from very small holdings, I may refer to a cottage plot of about three roods near to a town of 12,000 inhabitants, occupied by an old childless couple. Here a sow was kept, also poultry in large numbers. Vegetables were well grown, a succession being kept up for the market. The gross receipts amounted to over £55 a year.

"Well, you will soon be leaving the old home," I said on a recent occasion to a fine young fellow of 23 years of age. "I am not going to leave the place," was his reply. "What!" I said, "surely you are not going to settle down upon three and a half

acres of land?" "I am," he declared; "my father did well here, and I am going to do the same." One cow, some pigs and poultry were the means of bringing such a result from a poor farm reclaimed from a mountain.

Denmark and Sweden afford instances of what dairying and its attendant industries can accomplish. Some of those present may remember a visit to a district of 30-acre farms at the Scandinavian Conference. Here we found a number of farmers who held land from one of the Agricultural Colleges. One of the conditions of tenure at the commencement of the tenancy was that the systems of farming pursued should be under the direction of the College. The success was phenomenal. Comfort, happiness, and prosperity were everywhere apparent. And this suggests what must accompany any system of a creation of small holdings—there must be intelligent direction from above, and there must be educational methods of a suitable character along the line.

We cannot "dump down" a lot of occupiers on land and say: "Now, you fellows must take up dairying, and you others must go in for growing vegetables," etc., etc. There must be education, and there must be organisation, and above all, and before all, there must be an absolute condition of amenability to good influences, and a co-operative spirit on the part of the occupiers of the small farms. Dairying is the industry that lends itself to the powerful influence of these conditions.

The land must be made to bring forth its full complement of produce, and that produce must be put upon the market in the best possible condition. Foundations must be laid of knowledge and industry, and these may be relied upon to support in a near future a prosperous peasantry.

I hope that a promised visit of the British Dairy Farmers' Association to Ireland will shortly assume reality, and that many of the members here assembled will see results there from what has been done in the matter of the organisation of agricultural industries initiated by Sir Horace Plunkett, and now carried on and in process of development by the Department of Agriculture and Technical Institution for Ireland.

Professor Nuttall proposed a vote of thanks to Professor Carroll, who had given some capital information. A discussion of that sort was not a party one, although the subject was one frequently associated with party feeling. There were now before Parliament various small holdings Bills, but he confessed that he did not know a district where the demand for small farms had exceeded the supply. One of the great causes for the demand for small holdings was the losses sustained by large farmers, who were on the look-out for small farms, where they could do the work themselves. The land had lost its men because it could not keep them. This position had not improved; as a matter of fact, it had grown worse, and the land

was no more profitable than it was, and it would get worse until there was a sane Government which would deal with our system of so-called Free Trade and substitute for it Fair Trade.

Mr. G. Fiske seconded, and observed that near large towns in which the produce could be retailed, the holder of a small plot might get a living, but in the Eastern counties very little land hunger existed. The proportion of men who had the energy and capacity to make a small holding profitable was very small. The very intelligent people, as a rule, left the land to seek their fortunes in the towns or Colonies. He had no prejudices against small holdings, but he did believe that it was a wrong principle to put them on the rates and taxes. In his own neighbourhood large farms would shortly be sold, and would not realise more than from £10 to £15 per acre. Now was the opportunity for the "back to the land" people to purchase them, and turn them into small holdings.

Professor Long differed from Professor Carroll in his conclusion that the question whether the multiplication of small farms should be encouraged or not should be left to itself, and would settle itself by the inflexible rule of economic law. What caused the Irish farmers to co-operate was the work of Sir Horace Plunkett; while in Denmark it was the result of a land revolution, headed by the Danish Bishop. It had been suggested that the promotion of small holdings by the Government would lead to a call upon the tax or ratepayers, but under the present Government Bill no land was to be let unless the cost was covered by the rent. Denmark, the home of small holdings, was the most prosperous agricultural country in the world. Even in England the results could be seen. In Worcestershire, four and five acre holdings were prosperously run by fruit-growers, many of whom had previously had no agricultural training. These instances could be multiplied in other counties, and should prove that small holdings could be made successful if people were amenable to reason. The education given children should be more of a technical character. (Hear, hear.) Men emigrated to Canada because they could not get land at home.

Mr. J. W. Lord said that in East Sussex dairying products were necessary for the feeding of chicken, but he was sorry to learn that this was becoming a threatened industry. He wished to know how success could be obtained in small holdings. The land must be good, and near a town; the rent must be cheap, and the man must do the work of two men for the pay of one. His wife and family must assist him continuously, and practically without wages. The prospect was not encouraging, and lacked, under the present Government's Bill, the chance of becoming an owner. He objected to the form of education in rural villages which they were compelled to give to children. The tuition resulted in the children disdaining work on the land, but desiring to go to the towns. He admitted that on small farms dairying was one of the most suitable worked

upon proper lines, but the speaker gave some dismal instances of the ill-success which had attended people who had taken small holdings.

Mr. W. C. Brown urged the necessity for an agricultural education in the schools of England as was done in Ireland. He had no doubt that near a large town everything grown on a holding could be sold retail, but in many of the districts of Lincolnshire, and counties of that sort, the stuff had to be sold wholesale at inferior prices. He had large numbers of small plots of four acres and a half with good buildings, which he would be glad to let at £10 a year. They were called allotments, and were offered to farm labourers, but he could not get tenants. While admitting the possibility of small farms paying when they were near large centres of population, he thought in broad districts where many farms were 10 miles from a station, and a hundred miles from a large town, he was afraid they were doomed to failure.

Mr. Grant, of Newport, declared that in Monmouthshire small holdings were an unqualified success. It did not follow that because they were not successful in certain parts that they should be a failure everywhere. He hoped that the excellent proposals of Mr. Jesse Collings would be given the chance of becoming law. It was also their duty to see that children in rural districts should have a form of education which would fit them for working on the soil, and give them an inclination for cultivating the land.

Mr. E. C. Walker declared that the small holders in Denmark sold their butter to live, and ate margarine themselves.

Lord Kenyon, speaking as a landlord, said a false impression existed that landowners were opposed to the system of small holdings. As far as his experience went, and it was a wide one, landowners welcomed small holdings where they could be made to pay. It was entirely a question of economical arrangement. The very essence of land economy was that it should be flexible, and that what was suitable to Lincolnshire should be in Lincolnshire, and what suited Shropshire should be in Shropshire. There were a number of small holdings in his part of the country, but the creation of new ones was always attended with difficulty. Money had to be spent on the erection of buildings, and the interest on this capital with the rent for the land and the rates made up a large sum which a man had to pay before he could see anything for himself. When the holding was near a large centre of population, the milk, butter, and eggs could no doubt be sold to advantage. Any State interference would have to be tempered by local administration. On the question of men becoming the owners of small holdings, he had seen many men buy the land, and be compelled to sell at a loss. They frequently bought by mortgaging the land for as much as they could obtain, but they frequently found the mortgagee was a far harsher landlord than the landowner would have been. He believed tenure of land was secure to good tenants, for no landlord wished to get rid of a good tenant. If the Govern-

ment wished it, he was sure the landowners would be glad to give any help they could. In conclusion, Lord Kenyon appealed for more technical education of an agricultural character.

Mr. W. Troy, President of the Farmers' Club, extended a welcome to the Delegates on behalf of the Club, and moved a vote of thanks to the Chairman, which was carried by acclamation.

The party then proceeded in conveyances through Eridge Park (by permission of the Marquis of Abergavenny) and Shernfold Park, Frant, the residence of Mr. B. Newgass, to Snape, Wadhurst, the home of Sir Geo. Barham, a Vice-President of the Association, by whom they and a large number of local guests were generously entertained to luncheon. In subsequently referring to letters from absent friends, Sir George observed that one gentleman wrote to him that "all flesh is grass," and that when he had the dairy farmers with him he would have the finest crop at Snape that he had ever seen. (Laughter.)

Sir George proceeded to propose the toast of "The British Dairy Farmers' Association." In a felicitous speech he gave them all a very hearty welcome. Anyone who knew his connection with dairy farming or the dairying industry knew that everyone connected with it in any shape or form had a very warm place in his heart. (Applause.) Some of them would perhaps complain of having been brought there—"No"—as he had not much to show in the dairy way, but as Chairman and as President of three Dairy Conferences—in Sweden, the Channel Islands, and the Home Counties—and also as a Vice-President, he felt it his duty, having persuaded them to come into Kent and Sussex, to invite them to see him, and he was grateful that they had honoured him with their presence. It was said that young men live in the future and old men in the past. That Association was formed about 30 years ago, and was therefore nearly at middle age, so that it could look back to the past and forward to the future. He could not help feeling with regret how much they missed the dear old friends and earnest workers who were with them 30 years ago. There was the Rev. Canon Baggot, who loved the work, and who spent a great amount of energy and time in endeavouring to help the dairy movement in Ireland, and other names he recalled were those of E. C. Tisdall, Alfred Stapleton, and Lord Vernon. They remembered with regret that those men were no longer with them, but at the same time it was a pleasure to see some of those who might be termed "the old guard." They were delighted to have with them their good friend Professor Long, who had been in ill-health lately, and also Professor Nuttall who was prepared to assert and prove that the Stilton was the very best cheese made. (Laughter and applause.) He was sure it was the custom of the Association to go to places, not only where they could learn, but where they might teach; and in this district, situated as it was between the great Metropolis and the popular watering places of the South Coast, there was room for a large number of cows and dairy farms, and the production of

large quantities of milk, with profit to the tenants, the landowners, and the urban community.

Lord Kenyon replied on behalf of the Association.

Bidding farewell to Snape, the members continued their drive to Bayham Abbey, the estate of the Marquis of Camden, by whom they were entertained to tea. Some fine shire mares and foals were inspected, as well as a flock of sheep, a cross of the Southdown and Romney Marsh, and a useful Shorthorn dairy herd.

In the evening the members entertained a number of local guests at dinner at the Spa Hotel, Tunbridge Wells.

The next day, Wednesday, was devoted to the South Eastern College at Wye, whither the members proceeded by special train. At the College the visitors were received by Mr. M. J. R. Dunstan, the Principal, who delivered an address on its history. When it was opened in 1894 thirteen students entered, and at the present time the number in residence is 111—the full complement.

A herd of Lincoln Red Shorthorns is maintained at Coldharbour, the animals being all registered, a registered bull with good milking pedigree being used, whilst cattle of representative beef breeds are at the Silks buildings, typical cows of milking breeds (Ayrshire, Guernsey, Jersey, Red Poll) being also kept.

Feeding experiments with bullocks of different breeds are carried on so as to demonstrate to the students the characteristic points of the breeds of cattle to be met with in the United Kingdom, and the cost of production of meat. The breeds which the students have the opportunity of judging during their two years' course are : Aberdeen Angus, Galloway, Red Poll, Devon, Sussex, Hereford, Shorthorn, and Welsh.

The sheep are pure bred Kent or Romney Marsh, these being the native sheep of the district ; Southdown, Dorsét Horn, Suffolk, Lincoln, Oxford, Hampshire, and Shropshire. The breeding flocks, of which the Kent and Southdown are kept pure, are being improved yearly by the use of high-class rams, and by retaining the best of the ewe tegs. Feeding experiments with different breeds of sheep are carried out, and experiments on crossing with the view of early maturity and capacity for fattening are also conducted.

Five breeds of pigs are kept upon the farm, viz., Berkshire, Yorkshire, Large and Middle Whites, Large Blacks, and Tamworths, and for bacon purposes the varieties are crossed.

An early opportunity was taken advantage of to inspect the various rooms, laboratories, and workshops of the College, an inspection which bore eloquent witness of the thoroughness of the training.

The next procedure was a paper by Dr. Russell, a member of the staff, Lord Northbourne presiding over this gathering.

THE EFFECT OF FOOD ON MILK.

By Dr. E. J. RUSSELL, South Eastern Agricultural College.

It is, I am sure, unnecessary for me to point out that the question I am bringing to your notice to-day is one of the greatest importance to the practical man and of the highest interest from the scientific point of view. We get, perhaps, more enquiries from dairy farmers about the unfortunate morning's milk than about anything else; the afternoon supply is usually satisfactory, but it is often exceedingly difficult to keep the morning milk up to the 3 per cent. standard. The two chief causes appear to be: (1) Most men keep large-frame, deep-milking cows, which do not normally give milk with much more than 3 per cent. of fat; (2) the milking had to be done at hours suiting the milk train, and not at hours suiting the cow. It is not too much to say that if the animals could be milked at 12-hour intervals, say at 5 a.m. and 5 p.m., most of the trouble would disappear. But in practice it commonly happens that the interval between the morning and afternoon milking is ten, or even only nine hours, and that between the afternoon and the next morning's milking is fourteen or fifteen hours. The consequence is that the morning's milk is poorer than the afternoon milk; and as the cows in question have so little margin of safety, the former milk is usually below the standard, while the latter is above it. We are very frequently asked whether there is any food or mixture of foods which will increase the percentage of fat in the morning's milk.

The question looks a simple one, but in reality it is very complex, for it involves the whole problem of the effect of food on milk. This problem is by no means settled, and if to-day I give you an account of its present position, it is not entirely on account of its intrinsic interest, but partly with a view to showing you how your Association can furnish valuable information on this matter to the scientific investigator.

Ever since the remotest time, men of an enquiring turn of mind must have been making feeding trials, but the first that need concern us are those of the celebrated French chemist Boussingault. He investigated the effect of food on the yield of milk, and as this question happens to be the simplest one, besides coming first in historical sequence, we will begin with it.

RELATION BETWEEN THE YIELD OF MILK AND THE QUANTITY OF FOOD.

The cow affords a good illustration of the universal law that the race must be preserved whatever the individual suffers. The

natural object of the milk is to feed the calf, and the cow will continue to give milk even if she is starving and losing weight.

When more food is supplied the animal does better herself, and also gives more milk, but the extra milk does not correspond to the extra food. A Norwegian investigator (Holtsmark) has tabulated and examined the records from 846 Norwegian dairy herds, and one of his tables is of great interest. It shows the amount of food supplied, and the amount of milk obtained; for convenience of comparison, the rations are calculated out as food units:—

No. of food units				Average yield per cow for the year lbs.				Increase in milk production per 500 food units lbs.			
1,500	..	..	..	2,030	..	..	..	—
2,000	..	..	..	3,133	..	..	..	1,103			
2,500	..	..	..	3,988	..	..	..	855			
3,000	..	..	..	4,689	..	..	..	701			
3,500	..	..	..	5,280	..	..	..	591			
4,000	..	..	..	5,790	..	..	..	510			
4,500	..	..	..	6,240	..	..	..	450			

The first additional 500 food units gives 1,103 lbs. of milk, subsequent additions give less and less, finally the last one only gives 450 lbs. of milk. Agriculture furnishes many instances of the law of Diminishing Returns, but perhaps none better than this. The vitally important point to the farmer is that up to a certain point an increase in the amount of food supplied gives a profitable increase in milk, but beyond this point the increased milk yield no longer pays for the increased food. Every man must decide for himself just where to draw the line, but there are one or two general principles which furnish valuable guidance.

The first requires a little explanation. The food supplied to the cow is used for two purposes: (1) to keep the cow alive; (2) to make milk. A considerable amount is needed for the former purpose; the body temperature has to be kept up, the heart must be worked to force blood through the blood vessels, the lungs must be worked, energy is wanted for digestion and for a variety of other purposes. All this is collectively spoken of as maintenance, and a ration which just enables all this to be done with nothing to spare is called a maintenance ration. If an animal is to lay on flesh, or to produce milk without losing flesh, it must receive more than a maintenance ration, and the greater the quantity of extra food the more there is available for flesh or milk production—up to a certain point.

In America the maintenance ration of dry, barren cows has been determined; but in Germany experiments have been confined to bullocks, and it is supposed that the maintenance requirements of dry, barren cows, and of bullocks, are substantially the same.

The standard rations commonly accepted in Germany are those given by Wolff, and subsequently modified by Lehmann:—

The Wolff-Lehmann Rations per 1,000 lbs. Live Weight.

	Dry Matter	Digestible Nutrients in lbs.			Nutritive Ratio
		Oil	Protein	Carbo-hydrates	
Maintenance only (bullock) ..	18 lbs.	0.1	0.7	8.0	1 : 11.8
Cow giving 22 lbs. milk daily.	29 lbs.	0.5	2.5	13.0	1 : 5.7
Cow giving 27½ lbs. milk daily	32 lbs.	0.8	3.3	13.0	1 : 4.5
Fattening cattle ..	30 lbs.	0.5	2.5	15.0	1 : 6.5

The American rations are somewhat lower.*

	Dry Matter	Digestible Nutrients in lbs.			Nutritive Ratio
		Oil	Protein	Carbo-hydrates	
Maintenance only (dry cow)	12.5 lbs.	0.1	0.6	6.2	1 : 10.7
Cow in full milk ..	24.5 lbs.	0.74	2.15	13.3	1 : 6.9

The last column, the nutritive ratio, shows the proportion of fat and carbohydrates to protein; and it will be observed that in these rations a dairy cow is allowed more protein relatively to the fat and carbohydrate than a fattening animal, and much more than a store animal or a dry cow.

It is unfortunately not possible to give a good average English ration, because, so far as I am aware, no sufficient number of rations has been collected and examined. If your Association could collect and group rations known to be satisfactory in practice, and put the results where they would be accessible to the members of the Agricultural Colleges, you would be doing an extremely useful and important piece of work. We have few precise figures, but an examination of a number of rations shows that good English feeders also recognise that a cow requires for milk production a diet rich in protein; highly nitrogenous substances, cotton cake, bean meal, etc., are well recognised dairy foods. The value of a set of standard rations would be that one could tell whether and to what extent a particular ration is abnormal; it is, for instance, well known that to feed excess of protein is extremely wasteful.

The second point is that there is a limit to the yield of milk beyond which the cow cannot go, no matter how much food is supplied to her. The limit depends on the activity of the milk glands and the power of the animal to transform into milk the food which has been digested and taken up into the body; these features are born in the animal, and their full development depends on proper management. You may, and you should, breed for them, but you cannot put them into an animal that does not possess them. Some recent experiments made at Offerton Hall, Sunderland, by Gilchrist and Bryner Jones,† illustrate this well. Ten cows at pasture were divided into two lots of five each, so arranged that the average yield of milk per day was practically the same in each lot.

* See Woll, "Wisconsin Bulletin," No. 116, 1904, for a full discussion.

† Trans. Highland Agric. Soc., Vol. 19, 1907, p. 114.

During the experiment one lot received concentrated food—a mixture of maize meal and Bombay cotton cakes, together with straw chaff—and the other received none. The effect on the yield is given below :—

Preliminary Trial—No Concentrated Food.

		Milk per Cow per day			Fat per cent.	
Lot 1	.. ..	30.2	pints	.. ..	3.48	
Lot 2	.. ..	30.2	pints	.. ..	3.46	

First five weeks. June 19th—July 23rd, 1903.

		Concentrated Food		Daily Milk yield per Cow		Per cent. of Fat		Solids not Fat
Lot 1	.. ..	4 lbs.	..	27.3	pints	..	3.37	.. 8.71
Lot 2	.. ..	None	..	27.7	pints	..	3.43	.. 8.81

Second five weeks. July 24th—August 27th, 1903.

		Concentrated Food		Daily Milk yield per Cow		Per cent. of Fat		Solids not Fat
Lot 1	.. ..	8 lbs.	..	22.5	pints	..	3.39	.. 8.69
Lot 2	.. ..	None	..	21.7	pints	..	3.52	.. 8.77

The extra food does not increase the supply of milk, and does not even check the falling-off in yield as the period of lactation advances. The animals were already producing as much milk as they possibly could, and no amount of extra food could enable them to produce any more.

EFFECT OF FOOD ON THE PERCENTAGE OF FAT.

Perhaps no question in the whole of agriculture chemistry has been more debated than this one.

Fifty years ago milk was supposed to be formed from the blood of the animal, and the protein and fat present were considered to be formed direct from the protein and fat in the food. The best authorities stated that by increasing the fat in the food it was possible to increase the fat in the milk. †

One of the first to dissent from this view was Kühn, who, in 1869, stated that the percentage of fat in the milk depended on the cow alone, and could not be altered by changing the ration. A few years later he recanted, but the question was taken up, and has been attacked by an enormous number of investigators since the introduction of the Babcock and the Gerber tests has made milk analysis a simple matter. It is now known that many of these experiments have little or no value; trials with only small numbers of cows lasting only three or four weeks must be regarded very doubtfully. Without going into the history of the question, it may be said that the best results all showed that the percentage of fat

† e.g. See Morton's "Cyclopædia of Agriculture." Voelcker's article on "Nutrition of Dairy Stock."

could not be permanently altered by change of food, provided the animal remained in good condition. Perhaps the most reliable experiments are those made at Copenhagen, and they have been so admirably conceived, and so well executed, that we may profitably spend a short time discussing them.

The experiments are carried out by members of the Copenhagen Laboratory Staff on farm where 150 or 200 cows are kept. Forty or fifty young cows which have recently calved are selected, and arranged in three groups as nearly alike as possible. Every individual cow in one group closely corresponds in age, weight, milk yield, and quality of milk with a cow in each of the other two groups; only 30 are actually wanted, and there is consequently an ample margin to allow of the rejection of unsuitable animals. The first or preliminary period of the experiment lasts one or two months, during this time the three groups are all kept on the same ration, which includes the two foods that are going to be tried, and the milk is daily weighed and analysed. Then begins the experiment proper. One group keeps pretty well to the old ration, the second group receives a larger quantity of the one food under trial and none of the other, while the third group receives a larger quantity of the latter and none of the former, but the rest of the ration is the same for all. For another one or two months the milk is weighed and analysed each day. In the third or final period the animals go back to the same ration, and the milk is weighed and analysed daily for a further one or two months. The trials are carried out on about eight farms for two years, they are then considered complete. From 1887 to 1900 no fewer than 2,000 cows were used for these trials; the general results showed that as regards quantity of milk produced, 10 lbs. of Danish mangolds were equivalent to 2½ lbs. of hay, or 1 lb. of either wheat, wheat offal, or maize, all of which were equal; but the best results were given by cake, especially if mixed with a suitable quantity of roots. Change of ration had, however, no appreciable effect on the percentage of fat or of total solids in the milk:—

Wheat and Beet compared as Dairy Food.

Group Ration in lbs.:	Preliminary Period			Experimental Period			Final Period		
	A	B	C	A	B	C	A	B	C
Wheat		3.65		4.64	3.43	2.20		2.51	
Mangolds		2.96		—	23.66	47.30		16.72	
Cake		2.73		3.43	3.15	2.86		3.65	
Bran		2.33		3.40	2.73	2.05		4.09	
Hay		7.37		8.31	8.31	8.31		7.04	
Straw taken ad lib.		12.41		13.16	12.41	11.66		9.70	
Fat in ration, lbs. . . . .		.73		.88	.79	.70		.57	
Protein		2.17		3.04	2.82	2.60		2.73	
Daily yield of Milk, lbs.	27.72	27.72	27.60	23.97	24.20	24.20	22.10	21.90	21.77
Fat per cent.	3.21	3.16	3.16	3.22	3.17	3.15	3.32	3.28	3.34
Total Solids per cent. . .	11.74	11.74	11.74	11.25	11.87	11.86	12.10	12.07	12.12
Grain in live weight per day.	—	—	—	15	21	21	—	18	102

On ration C the animals had nearly 50 lbs. of roots daily, on ration A they had no succulent food ; there is, therefore, considerable diversity in the character of the ration. There is also a fairly large difference in the composition of the ration ; A contains 25 per cent. more fat and 17 per cent. more protein than C, yet there is practically no difference either in the milk yield, the percentage of fat, or the gain in live weight. If, further, we compare the three groups over the three periods, it is evident that the animals do equally well on all the rations employed, and we may conclude that very different rations, which are equally well suited to the animal, give equal amounts of milk containing the same amount of butter-fat.

This result was confirmed in Germany, in America, and in England, and for some years it was customary to say that the composition of the milk was independent of the ration, and that no matter what food was given it was impossible either to increase or to lower the percentage of fat. Temporary increases were often obtained, but the effect soon passed off.

Most practical men would not believe this, and, as a matter of fact, the conclusion could not legitimately be drawn from the experiments. None of the rations in the above experiment, and, so far as I know, no ration in any reliable experiment, in any way approached the heavy rations of watery material some of our ordinary farmers use. Where, for instance, one bushel of wet grains and one or one-and-a-half bushels of mangolds are fed with but little concentrated food, it is quite conceivable that the quality of the milk may suffer simply because the cow herself suffers, and there is no evidence to show that the addition of more cake will be without effect on the percentage of fat. This is a point awaiting investigation, but if the results are to be of any practical value, the experiments must be carried out on the bold lines of the Copenhagen trials.

Indeed, most agricultural chemists would now admit that the percentage of fat can be altered by changing the ration. Some of the earliest experiments which showed this were carried out in Connecticut at the Storrs Experiment Station during the years 1892 to 1901. By increasing the amount of protein fed to the animals, it was found possible to increase the amount of fat in the milk. As a mean of twenty trials, the following results were obtained :—

		Digestible protein in Ration		Fat in Milk
First ration ..	..	13.6 per cent.	..	5.13 per cent.
Second ration ..	..	18.8 per cent.	..	5.32 per cent.
		<hr/>		
Increase ..	..	5.2 per cent.	..	19 per cent.

Similar increases have been observed at other American stations, and also in the Leeds experiments carried out by Dr. Crother. The result is of considerable scientific importance and of some practical

value, because it shows that the practice of feeding nitrogenous food stuffs is sound. But it also shows that the dairy farmer cannot expect to get any marked increase in the percentage of fat even when the amount of the protein is considerably increased.

A study of the most important experiments that have been made leads to the conclusion that if animals are well housed, well looked after, and on a ration which keeps them in good condition, then a change to an equally suitable ration will have little or no permanent effect on the fat in the milk. But if the animals are on an unsuitable ration, or receive excess of watery food, it is quite conceivable that the fat content can be increased by improving the ration. Further experiments are necessary on this point.

EFFECT OF FOOD ON THE COMPOSITION OF FAT.

If the effect of food on the quantity of fat in milk proved a difficult subject for investigation, its effects on the composition of fat is much more so, and our present information on this point is not very extensive. Milk fat is a mixture of about a dozen different fats, some of which are found only in milk, whilst others occur in the animal body and in oil seeds. The characteristic fats are those derived from volatile acids, and the analyst relies largely on these in testing the purity of butter. Another important fat is olein, which at ordinary temperatures is liquid.

The butter-maker is concerned with the composition of butter-fat because if the proportion of volatile acids obtained is low, he may be suspected of adulteration, and if the proportion of olein is high the butter will be soft and not easy to work; if low, it will be hard.

It was pointed out many years ago by Nilsson, of Stockholm, that the composition of the fat depends on the condition of the cows: even a slight indisposition depresses the proportion of valuable acids, but the most marked change observed is a rapid rise, and then a gradual fall, in the volatile acids as the period of lactation advances. More recently Van Rijn, in Holland, has shown that when animals are exposed to sudden changes of temperature, in particular when they are kept out late in autumn in wet, cold weather, the amount of volatile acids also falls, but it becomes more normal when the animals are housed and well fed.

These two considerations show that the problem is not a simple one, but is complicated by nervous conditions; there is, however, a certain amount of evidence showing the effect of food on the composition of butter-fat. The best experiments are those made in Denmark, and given in the 37th Report of the Copenhagen Station. The foods examined were cake and corn, fed with a basal ration of bran, hay, roots, etc.; and the effects of replacing turnips by mangolds was also investigated. The analytical results are given here; the "Iodine absorption" affords a measure of the amount

of olein, and the "Reichert-Wollny number" indicates the amount of volatile acid obtained :—

		Iodine absorption		Reichert-Wollny number
Basal ration and corn	..	31.4	..	30.8
Basal ration and corn and cake	..	35.6	..	31.3
Basal ration and cake	..	39.4	..	30.1
Mangolds .. .. .	..	33.2	..	30.8
Turnips .. .. .	..	35.5	..	29.7

Sunflower cake was used in the above experiments, but similar results were obtained with rape cake. It will be observed that when corn alone was fed the butter-fat gave a lower iodine absorption and contained less olein than when cake was fed; the butter in the former case was hard and brittle, in the latter it was more pliable, and therefore of better quality. The effect of using turnips instead of mangolds was somewhat the same, but less marked: it was observed, however, that the turnip-made butter had a peculiar flavour, from which the mangold butter was free. Pasteurising the cream prevented the development of this flavour, and the difference between the turnip and the mangold-made butter then disappeared. The amount of volatile acids only changed slightly: later experiments also show that these are not much affected by concentrated foods.*

The effect of putting the cows out to grass was also investigated. The olein was found to increase, accounting for the well-known extra softness of the butter at this period, and the volatile acids somewhat decreased. Bringing the cows back in autumn had the reverse effect :—

		Change from Cows shed to Pasture, Spring		Change from Pasture to Cows shed, Autumn	
		Iodine absorption	Reichert- Wollny number		
		Iodine absorption	Reichert- Wollny number		
1 week before change	.. ..	30.0	31.8	43.2	26.2
1 week after change	.. ..	39.3	29.3	37.8	28.4

These results were confirmed by Thorpe in an examination of numerous samples of English butter reported to the Departmental Committee on Butter Regulations (1904).† The figures require some care in interpreting, because quality in butter is less influenced by the composition of the fat than by the method of ripening the cream and of making the butter. The amount of olein is, however, important to the butter-maker, because an excess renders the butter soft and a deficiency makes it hard.

There are one or two other questions which I only touch upon to elicit information, and this information I hope your Association will be able to furnish for the benefit of the chemist.

* See especially Crowther. Trans. Highland Agric. Socy., 19, 1907. 55.

† See Appendix 29 to the Report, p. 505.

One important point is the effect of food on the palatability of butter. It is asserted by some that cows pastured on grass give a more palatable butter than cows fed on roots, hay, cake, etc.; others say that by properly managing the ripening and churning the difference in flavour disappears. Some of the constituents of certain cakes appear to get into butter and may impart a flavour; the Danes obviate this by feeding somewhat complex rations, like the one already given. There is evidence to show that food affects the churnability of milk, *i.e.*, the percentage of fat which can be recovered by the butter-maker. The interesting experiments of Mr. Speir, on the effect of food on the quality of butter, also want confirming. He found, for instance, that linseed cake, gluten meal, and distillery grains all produced butter containing a good deal of water, whilst nitrogenous foods had the opposite effect.† Then there is the question of colour. In some trials made here it was found that carrots gave a rich colour to the butter, but other foods are supposed to have the reverse effect. Lastly, there is the very interesting point raised by Mr. McConnell last year—the influence of the soil on the character of the milk. Authoritative information on these and similar points is very desirable.

Mr. George Taylor, Cranford Park, moved a vote of thanks to Dr. Russell. He put the Jersey and Guernsey first for quality of milk, and the Shorthorn next. With almost the whole of the paper he cordially agreed. His own milking hours were very irregular—4 a.m. and about noon. It was difficult to keep up to the standard under these conditions. He advocated the circulation of such papers as they had just heard among the workmen. There was a distinct source of profit in weighing the milk. Even if they did it only once a week they would find it a great help.

Mr. W. C. Brown, Appleby, Lincoln, seconded. He eulogised Mr. Dunstan, who was their man in Lindsey before the South carried him off. It was an advantage in feeding cows to have regard to the albuminoid ratio. They felt the necessity of doing so when they fed themselves.

Professor Blundell, Cirencester, supported. He congratulated the Wye College on its splendid equipment, and its success under its successive Principals. The mother College of Cirencester was not jealous of her daughters. He hoped they might be able to revive her. He congratulated Wye on having a Principal who was so up-to-date in the way of organisation and management. He thought the foundation of success in managing a herd lay with the stockmen. They should be taught to discriminate between their cows, and feed according to milking results. They must not have a ration which costs more than 8s. to 10s. per week. A stockman can either make money or lose money for his employer by his system

† See Trans. High. Agric. Soc., 1896 (p. 282) and 1897.

of feeding. A proportion of from 6 lb. to 8 lb. concentrated food per cow would be found sufficient. The condition of the food was important. It ought to be laxative rather than the reverse. There was a considerable difference between a milk cow and a feeding bullock in respect of the food consumed and its effect on the system. With the rapid growth of grass, the increased flow of milk rendered it difficult to keep up to the standard of butter fat. It ought to be recognised that the ordinary farmer could not very well feed a scientific ration. He had to give his cows what he grew on the farm. Some farmers in his neighbourhood bought potatoes at 10s. per ton, and found them very profitable feeding for milk cows. Cleanliness and grooming could not be too strongly insisted on. If the cow was kept comfortable, and felt comfortable, she would yield her milk. It was a good plan to wash down the stalls and walls every morning, and groom every day. The cost would be from 6d. to 1s. per cow per week, and this would easily be repaid.

Mr. F. J. Lloyd said Dr. Russell had been dealing with a problem which the scientific man must first solve before the farmer could benefit. It was quite an erroneous view to suppose that they could not affect the quantity and the quality of the milk given by the cow by the food given to her. This view had done a great deal of harm. Food materially affected the health of the cow and the character of her produce. There must be a point in feeding which was too much or too little: the right point is somewhere between these two. The difficulty in feeding was to fix the albuminoid ratio. Several of the ways in which farmers fed their cows were thoroughly bad. They were wrong alike in respect of quantity and of quality. He was convinced that the colouring of the milk was in some way due to what was called chlorophyll or green matter in plants. There were certain well-known changes in colours, and the green could pass into yellow. Another problem was the ill flavours in milk. The food given to cows affected the milk not only chemically but also bacteriologically.

Dr. Van Rijn, Friesland Commissioner in London, said it was important to know whether the changes which took place in milk were not indirectly rather than directly due to the food and external circumstances of the cow; whether these changes were not chiefly due to the nervous condition of the animal. He had made a close experiment on this point with three groups of four cows each, one being kept in the stables, while the other two groups went out to the meadows. He found that it was the cows in the stables which had been affected in their milk supply rather than the cows which went to the meadows. It was not the feeding alone which affected the milk, but the whole general condition of the cow. These cows which did not go to the meadows were greatly excited when their neighbours went, and their milk was affected, although their food was unchanged. The food of the other cows was subjected to a violent change, yet their milk was unaffected. The farmer was at the mercy of his food supply. He must feed what it is economical

for him to give the cows at the moment. The cow is a product of nature, and the farmer had to take what nature gave him. The same was true of her milk. Under normal circumstances what will be the composition of the milk of a particular cow? Honest farmers being at the mercy of nature were not able to keep up to artificial standards. The foundation on which all these standards for natural products were based was unsound. Each cow must be treated as a unit. There is as much individuality among cows as there is among human beings.

The Chairman closed the discussion. He said he was partial to seeing women managing both the cows and the dairy. He saw nothing degrading in dairy work, and thought the Association was good for both cows and women.

The company then adjourned for luncheon, over which Principal Dunstan presided. In replying to the toast of the "Wye College, its Governors and Staff," he said their motto and aim there was education and investigation, the two going hand in hand. The students who had gone from them brought credit to themselves, and reflected back credit on the College. He deeply regretted to see the best men leaving the country and the wastrels whom we were importing. Agriculture was suffering from low prices and insufficient and inefficient labour. They had to study the cost of production; to study the £-s. d. of production. Their aim must be to improve the average standard. The causes of the defective labour were varied, but he mentioned these—insufficient houses, low wages, and want of good prospects. No doubt houses had been improved, but much had yet to be done. In many places there was still room for great improvement. Competitive standards of skill would be useful. There was a considerable difference between 18s. and 25s. per week in a labourer's house. Higher wages would require to be paid if they were to keep the best of the labourers on the land. The labourer's prospect was 18s. per week as long as he was able to work, and beyond that it was a blank. They must hold out a prospect to the labourer. In that College, and in all the colleges, they wanted to get at the small farmer and the labourer. They had not yet reached them. How were they to do it? Hitherto education in the elementary schools had been not wrong in quantity but wrong in quality. They required to see the application of knowledge to country pursuits: to teach those things which pertained to life in the country. (Loud applause.)

After luncheon the party were conducted over the College farms and experimental grounds. The farms cover 460 acres, of which 163 are arable, 247 grass and down, 5½ forestry plantations, 7½ fruit gardens, 7 vegetable garden, and 7 hops. Tea was provided on returning to the College, under whose auspices a memorable day was spent.

Thursday was reserved for a round of visits to Kentish farms and estates, embracing the most notable on the route selected.

Here, as elsewhere, the greatest and most hospitable kindness was shown to the visitors, so much so, indeed, that the journey was only concluded at a late hour. For our notes on the day's proceedings we are indebted to an excellent notice which appeared in *The Farmer and Stockbreeder* :—

“The day was begun with a visit to Dunorlan Farm, where Mr. William Roper showed a small herd of Jerseys, the property of Mr. B. H. Collins. The herd, which only extends to some 13 cows, with a corresponding complement of young stock, is used entirely for private purposes. The best milk cow in the herd is “Merit,” which gave 1,000 gallons of milk in 1906. The average of the herd works out to something over 800 gallons per cow. The cows were well housed, and the cow-house was arranged on the principle of having a feeding passage in front. The gutter behind the cows was rather wider than some that were seen in well-appointed cow-houses. This question of feeding passages in front of cows' stalls provided matter for considerable discussion during the tour. It was first suggested by a model of farm buildings at Wye, in which the arrangement was a feeding passage down the centre, with the cows standing head to head. This arrangement seems now to find but little support, on the ground of the danger that might arise from an unhealthy cow's breath. For handiness of feeding it is no doubt the ideal arrangement. In this respect a feeding passage between the wall and the cows' heads, with the animals standing tail to tail if the house is double, is only a little inferior, and on the score of labour both are acknowledged to have an advantage over the old and yet most general method of tying the cows close up to the wall, and carrying food up the stalls. Yet many practical men are not convinced that it is all saving, and it is worthy of note that on some of the most practical farms visited the old arrangement was adhered to. While the feeding passages provide a saving in labour, they also make what labour there is easier, with the result that labourers are perhaps not quite so careful of fodder as they would be had they to carry it to each pair of cows. Some incline to the opinion that the waste of hay is so great when it can be wheeled in and thrown before the cows from the feeding passage that the saving in labour is more than counterbalanced. Further, the initial expense of building must be somewhat greater, as extra width is required, but given careful labour there does not appear to be anything against feeding passages.

“Somerhill was the next point of call, and here Mr. O. E. D'Avigdor's dairy and cattle were inspected. The company were received by the agent, Mr. C. J. G. Hulkes, formerly well known as a breeder of Kent sheep, who, with the bailiff, Mr. Roberts, showed them round the farm. A herd of 20 Jersey cattle and about double that number of Sussex cattle are kept, while considerable attention is given on the farm to pigs and poultry, including buff Orpingtons, ducks, and turkeys. The Jerseys are housed in a double cow-house with a roof of two spans, and stand tail to

tail, while there are feeding passages in front. The stalls are probably longer than is desirable, though it must be remembered that on one side they were intended for Shorthorns. There is little to be gained by length in stalls even one inch above what is necessary, and much to be lost. There is an ample and spotlessly clean passage between the cows some 8 feet in width, but many would have liked the arrangement better had there been more width in the gutters, which were somewhat narrow. At one end of the cow-house there was a wash-hand basin and towel for the milkers, and a slate for recording the milk yields morning and evening was also in evidence. Up-to-date dairy farmers generally realise that there is one, and only one, judge of a milking cow, and that is the scales. Indeed, at all the farms visited milk records were kept, either daily weighings or the almost equally satisfactory weekly weighing. The dairy at Somerhill is well removed from the cow-house some twenty or thirty paces, with a cottage intervening. Here the bailiff's wife presides, and showed some specimens of the produce of the herd. The Sussex cattle were then examined, and after a walk through the grounds and past the historic mansion, which at one time was the home of Queen Anne, the party again mounted the brakes for a long drive to Horns Lodge, where Earl Derby's noted herd of Sussex cattle was seen. The herd is well known in the showyard, and its representatives are generally well to the fore in competition. They have the privilege of spending their days when not on the pasture in elegant, almost palatial, quarters. There is a row of capitally appointed and roomy cattle boxes, attached to each of which there is an exercise yard, on the plan that prevails in many piggeries. The neighbourhood of Tunbridge Wells and Tonbridge is in the heart of the hop-growing district, and the circular hop-drying kilns, or oasthouses as they are called, are familiar objects all over the county. Unfortunately, many of them, as at Horns Lodge, have been converted to other uses since the days that foreign competition has made hop-growing a precarious business. Having examined some of the cattle at pasture, and partaken of welcome refreshments provided by his lordship, a start was made for Mr. Cazalet's estate at Fairlawn, Shipbourne, where Jerseys and Dairy Shorthorns were among the attractions. Mr. and Mrs. Cazalet received their guests in person, and with the assistance of the agent, Mr. C. L. Fox, conducted the party over the farms. Mr. Cazalet's Jersey herd extends to slightly over two score head, all told. The Jersey herd is well known in the showyard, and that they are good for more than looking at is gathered from the fact that the cows' average milk yield tops 600 gallons per annum. The leader of the herd in this respect is "Miss Bessie," which has been responsible for 1,070 gallons in twelve months. The milk is weighed daily, morning and evening, and the cows have every inducement to do their best at the pail, for they are housed in an elegant double cow-house, with plenty of air space. It is kept in fine condition, and the varnished ceiling gives a smart, cleanly, and finished appearance.

The cows stand tail to tail, with their heads to the wall, and no feeding passages. The Shorthorn herd is more extensive, about a hundred non-pedigree cows being used. These are a fine lot, and were examined with interest. Milk records are kept here by means of weekly weighings, but it is only about eighteen months since they were started. Some of the best cows yield in the neighbourhood of 1,000 gallons. A nice bunch of Blue-greys were much admired—not milk animals these, but second to none for beef production. After a walk through a beautiful park containing a lovely avenue—which it seems a pity does not adorn a drive—the company, after their busy forenoon, did ample justice to the excellent luncheon to which they were entertained by Mr. Cazalet, who presided.

“The summer weather we have had this year has been so slight as almost to pass unnoticed, but after weeks of rain the Conference was remarkably fortunate to have on the whole splendid weather during the tour. After luncheon there was a half-hearted attempt at rain, but as on other occasions during the morning it came to nothing. Mrs. Cazalet, after luncheon, showed some of the beauties of the garden; and then, as a change from Jerseys and milking Shorthorns, the party set out to visit Swaylands, the home of Mr. George Drummond’s first-class herd of Aberdeen-Angus cattle and other stock. It is by reason of the “black but comely” breed that Swaylands is best known in the stock-breeding world. Mr. Drummond was present in person to receive his visitors, and Mr. Rodgers, his manager, had some representative specimens of the herd paraded for inspection. Noticeable amongst these was the stock bull “Eboniser,” bred at Ballindalloch, the Mecca of the Polls, and with his veins full of champion blood. Not a big bull this, but standing on short legs he is bigger than he looks, with great strength, fine flesh, and straight, even lines. “Effulgent of Danesfield 2nd” has shown that her strain, while unsurpassed for beef, can also fill the pail. She has a wonderfully fine bag for an Aberdeen-Angus, and good for any breed; she has been yielding four gallons of milk daily. A few good Shire horses, some Berkshire pigs, and Jersey cattle, kept for the supply of dairy produce for the house, were also inspected, and then the magnificent rock gardens were visited. These baffle description, and have only to be seen to be appreciated. They were laid out at enormous expense—over a quarter of a million—and are indeed a fairy land in miniature, covering some eleven to thirteen acres, we believe. To many they were the tit-bit of the tour, and, as one of the company remarked, had they got there at ten o’clock in the morning Mr. Young’s whistle would have had some difficulty in collecting all the stragglers before evening.

“An ardent Scot, in defending the honour of his county so far as size was concerned, maintained that it would be a big county if it were flattened out. Kent might undergo this process with considerable benefit to the traveller, though not to her scenery.

These Kentish roads seem to run consistently on the switchback principle, and progress had been slower than anticipated, so that the last two items of the day's programme had to be omitted, one of them afternoon tea, a function of no small importance, and the other a visit to Penhurst Castle, which was a disappointment to many."

In the evening, as on the previous one, an Illuminated Promenade Concert was provided on "Ye Pantyles" at Tunbridge Wells, by the kind forethought of a number of local gentlemen in honour of the Association. Prominent amongst these friends was Mr. John Brown, who from the moment the proposal to visit the district was first mooted, was unceasing in his endeavours to co-operate with the Association in organising a successful tour. These efforts, backed as they were by those of other local members, resulted in a welcome whose heartiness could not have been exceeded. A pertinent remark, made by Mr. Cazalet after his luncheon, remains to be recorded, for it is too good to be lost sight of: "A golden rule for the dairy farmer is to aim at the best possible stock, and not to be satisfied till he gets it."

The early morning of the last day (Friday) found the party in a special train *en route* for Glynde, near Lewes, the first item on the programme being a visit of inspection to the factory of the Glynde Creameries, Ltd., and the farm of Admiral the Hon. T. S. Brand. The Glynde dairy factory was established in 1887 as a private concern by the late Lord Hampden soon after his retirement from the Speakership. On his death, in 1892, the establishment was taken over by the present company, Admiral the Hon. T. S. Brand being a large shareholder and the Chairman of Directors. The creamery is divided into a milk-receiving room, a separating and churning room, a cream room, and a butter store. It receives milk from about 50 farmers in the district. A considerable quantity is consigned to Eastbourne, Brighton, London (where the Company has three depots), and elsewhere, the remainder being utilised for butter, cream, and cream cheese. A large trade is done in cream, which is sent away by post or rail in tins of varying capacity to towns on the coast. In April, 1907, a milk-receiving and separating station was established by the Company at Mayfield, 22 miles away. From the first, about 300 gallons of milk were daily received at this station, and there is every indication of an increasing supply. The Mayfield branch is able to cope with 1,000 gallons a day. The farmers are paid monthly, the milk from Jersey cows realising from 6½d. to 9d. a gallon (average of 8d.), and that from other breeds 5½d. to 8d. All the milk supplied must conform to a stated standard. The last dividend paid by the Company was 6 per cent.

Admiral Brand's Jersey herd at the Glynde Home Farm next came under notice. It consists of from 90 to 100 head, and was seen to great advantage in the Park, close to the house. In the cow-houses, which are of a serviceable character, ventilation is

provided at the eaves, and provision is made for supplying water in front of the cows. The herd has carried off numerous prizes in the showyard. Southdown ewes and lambs, to the number of 500. and some 100 Berkshire pigs, were also seen by the visitors. Admiral Brand also conducted the party over the mansion at Glynde Place, where the valuable furniture and pictures were greatly admired.

Returning by train to Lewes, a drive of five miles brought the members to Messrs. J. & H. Robinson's farm at Iford. Here they own and occupy 1,170 acres, besides renting two smaller holdings. The herd consists of about 90 milking Shorthorns and 3 pedigree Shorthorn bulls. The former, which are mostly bred on the farm, include several first prize winners at the Dairy Show in the inspection classes as well as in the Milking Trial and Butter Test Sections. The milk of each cow is weighed once a day, and sent away for consumption in London and Brighton. The following are a few of the more recent milk records:—

Lily	gave 4,551 gallons of milk in 4 years.	
Robin	3,770	" " " 4 "
Bluebell	3,103	" " " 3 "
Leisure	3,629	" " " 3 "
Flirt	3,102	" " " 3 "
Duchess	3,272	" " " 3 "
Fairy Duchess	2,792	" " " 3 "
W. Aster	2,640	" " " 2 " 5 mths.
Famous	2,184	" " " 2 "
Hemlock	2,201	" " " 2 "
Milkmaid	2,683	" " " 2 "
Ladylove	2,089	" " " 2 "
Diamond	2,083	" " " 2 "
Kestral	2,133	" " " 2 "
Daydream	2,146	" " " 2 "
Hawthorne	2,016	" " " 2 "
Queen Mab	2,156	" " " 2 "
Bertha Cranford	1,060	" " " 11 months.
Iford Garland	1,187	" " " with first calf.
Sweetheart	1,169	" " " " "
Iford Almond	973	" " " " "
Prima Donna	829	" " " " "

The above records were taken from consecutive years' milking in each case. The admirable dairy character of the herd has been brought about, and is being not only sustained but further developed by judicious selections of heavy milking cows possessing udders of good shape, and crossing them with pedigree bulls of proved milking strains. Although, as has been said, most of the cows have been bred on the farm, for several years past the herd has been strengthened by the purchase of exceptionally good

milkers from some of the best pedigree Shorthorn breeders. Other stock kept at Iford include a few Shire horses, a thousand South-down sheep, and from 50 to 100 pigs of the Large Black breed. The farm buildings are of a serviceable character, perhaps the most noticeable feature being the arrangement for supplying water in the cow-house. Running round it is a trough slightly behind and above the manger, this trough being formed of half a 9-inch glazed pipe, cemented at the joints, and the portion reached from each stall covered by a small lid, hinged on to larger ones, which can be opened by the cow's nose sufficiently to admit her head. Cows soon learn to avail themselves of the system, all that is necessary being to keep the lid open for a few days. Water from the milk cooler is utilised to supply the cows.

The Plumpton Creamery, which was next visited, is owned by the South Coast Dairy Co., Ltd. It is situated adjoining the Plumpton railway station, and has a depot in Brighton. The factory was established in 1891 by Mr. Henry Edwards, the present Managing Director, and was taken over by the Company six years later. Milk is received from farmers within a radius of about six miles, the present quantity being close upon a thousand gallons a day. The milk is paid for according to quality. No butter is made, the Company's business being entirely restricted to milk-buying and selling milk and cream to such towns as Brighton, Bexhill, Worthing, and Tunbridge Wells. Great economy has been brought about by the installation of one of Messrs. Cundall's Suction Gas Plant for driving the machinery, the saving in coal consumption thus effected being so considerable as to favourably affect the dividend.

A short further drive brought the party to Triangle Jersey Farm, Plumpton, the property of Mr. David Mutton. It consists of about 60 acres, all under grass; but what is called the Lower Farm, 35 acres in extent, is also occupied. On this combined area, 80 Jerseys of varying ages are maintained. Usually about 40 cows are in milk, a portion of their yield being sent to London, while the remainder is required in connection with Mr. Mutton's restaurant at Brighton in the form of milk, butter, and cream. Each cow's milk is weighed, and recorded morning and evening. The herd is a noted prize-winning one, and contains a number of splendid milkers. One of them—"Lucy"—although she is 14 years old and has produced 10 calves, was found to be yielding 40 lbs. of milk daily. When out at grass they are tethered on the plan adopted in Jersey, while the calves at pasture are penned in a long row of hurdles communicating with their night quarters. In these and in other matters connected with the farm management, great economy is practised. Indeed, the evidence of utility and ingenuity displayed were the subjects of general remarks. It is now nearly 40 years since Mr. Mutton commenced the breeding of Jerseys, the herd having been established by a judicious blend of the Dauncey type and the Duncans, resulting in a well-nigh unequalled strain. The

company received a warm welcome from Mr. and Mrs. Mutton and their two sons, and were entertained to luncheon on the lawn.

Later in the day a call was made at Preston Farm, on the outskirts of Brighton, a holding of 120 acres in the occupation of Mr. J. M. King. Only 5 acres are under permanent grass, while the greater portion is cropped with potatoes, rhubarb, cabbages, onions, and other market garden produce. As many as 140 Shorthorn dairy cows are kept, nearly all bought in distant markets, and their produce is sold in Brighton and Hove at the shops of the South of England Dairies, Ltd., of which Mr. King is a director. The milk and farm records kept are of an exhaustive character. The milk of each cow is weighed morning and evening, and the books show the milk produced, the stock of food purchased, and the stock at the end of each week. The Brighton Corporation's water is laid on to the head of each cow in the four sheds, one of the latter accommodating 55 animals, another 53, the remainder being in smaller sheds. Each cow is groomed daily, except on Sunday. The cows stand tail to tail, and the passage between is of concrete, covered with lime. A room is provided for the men to wash their hands, cool the milk, and wash the cans. Milking aprons and caps are provided for the milkers, and white overalls are worn by the men attending to the weighing. There are commodious food-preparing rooms, the machinery being driven by one of Crossley's engines. Very few calves are reared on the farm, but there is a herd of 58 pigs (Berkshire and Sussex crossed). Great cleanliness, neatness, and order prevail. It should be mentioned that there is a special set of regulations as to infectious diseases to be observed by Mr. King's employes. These rules, which are here given, are the more interesting by reason of the fact that, with slight variation, they have been in force for more than 20 years, having been originated in 1887:—

(1) Any person in the employment of Mr. J. M. King who

(a) Shall suffer from Scarlet Fever, Scarlatina, Diphtheria, Typhoid Fever, or any other dangerous infectious disorder, or

(b) Shall be living in a house with any person so suffering, or

(c) Shall be otherwise brought into contact with any person so suffering,

shall immediately give notice thereof to the said J. M. King, or in his absence to his Manager; and such person shall not milk cows, or handle vessels used for containing milk for sale, or in any way take part or assist in the conduct of the trade or business of the said J. M. King as cow-keeper, dairyman, purveyor of milk, or occupier of a milk store or milk shop, so far as regards the production, distribution, or storage of milk, until all danger of communication of infection to the milk, or of its contamination, has ceased.

(2) No such employe shall return to work without the consent, in writing, of the Medical Officer of Health, or some other duly qualified medical man to be nominated by the said J. M. King, which consent shall be handed to the said J. M. King.

(3) In the event of such consent as last aforesaid being given conditionally upon the employe ceasing to reside in the house in which any person is or has been suffering as aforesaid, the said J. M. King will (if such condition is complied with, and the employe does not return to, or have any communication

with such house until all danger of infection or contamination thereby has ceased), provide other lodging for such employé in substitution for such house.

(4) If any patient so suffering as aforesaid, and living or staying in the same house as an employé, is removed to the Sanatorium, or other approved place, the employé shall not be obliged to leave the house, and may return to work, provided he obtains and hands to the said J. M. King such consent as aforesaid.

(5) Any employé prevented by these regulations from discharging ordinary and usual work will nevertheless be paid full wages by the said J. M. King, but shall perform any other work, for which such employé may be reasonably fit, either for the said J. M. King, or, at his request, any other person.

(6) Nothing herein contained shall prejudice the right of the said J. M. King, or of any employé, to terminate the contract of employment by such notice (if any) as, but for these regulations, would have been sufficient to determine it, and upon such determination the obligations of all parties under these regulations shall cease.

(7) Any employé wilfully infringing or breaking any of these regulations may be immediately discharged by the said J. M. King without notice.

(8) All men to wash their hands immediately before milking; and, when finished, to take their own milking buckets to the can-house for cleansing.

We hereby severally undertake to abide by the above regulations, and acknowledge the same to be conditions of our employment.

(Signed).....

On receiving his or her weekly wages, each employé is required to sign a declaration that the first of these regulations has not been infringed. Before leaving this model farm the visitors were entertained to tea, and opportunities were freely availed of to thank the host for such valuable lessons as his farm afforded.

In the evening the official proceedings were terminated by a dinner at the Royal Pavilion, Brighton, Captain R. O. Bellasis, Chairman of the Conference Committee, presiding. A suggestive speech was delivered by the Mayor of Brighton (Councillor Gervis, M.B.), in responding to the toast of "The Corporation of Brighton." He referred to the close connection between the three M's—municipal work, medical work, and milk—and spoke of milk as a perfect food. He was sure they were not banded together in their great Association to study questions of the purity of milk supply simply for personal profit or to increase their trade, but that they studied these questions from the same point of view as medical men, that of increasing the well-being and the health of the whole community. (Applause.)—Mr. George Fiske (Ipswich) gave "Success to Sussex dairy farming." He said he was delighted with the splendid herds he had seen in the county; he had never seen better milk producers. Sussex farmers also knew how to dispense hospitality; the members of the Association had been treated splendidly in every way. Sussex people ought to be congratulated upon the way in which cows were kept in the county generally. It seemed to him the animals had every luxury, and it was far superior to anything in his district. He had never seen such splendid arrangements as at Mr. King's farm at Preston.—Mr. J. M. King, returning thanks, said Sussex farmers—were

gratified by the high terms in which the visitors had spoken. They regretted, however, that they had not been able to discover that Sussex dairy farming was remunerative: in poor seasons they had to keep the cow instead of the cow keeping them. (Laughter.) Their great aim as a body was to furnish a pure article. Mr. King urged that in every instance where animals were slaughtered by order of the local authority ample compensation should be paid to the farmer. The present scale was absurdly inadequate. (Applause.)—Mr. A. J. Carpenter gave “The British Dairy Farmers’ Association,” with congratulations to the members on the excellent work it was doing.—Response was made by Mr. W. C. Brown (Lincolnshire), who said the reception the members had met with had exceeded anything of the kind in his experience of previous conferences. Mr. King’s dairy farm was the best of the kind he had ever seen, and he thought milk from such places as his ought to command a higher price.—Acknowledging the toast of his health the Chairman said the members had learned a great deal in Kent and Sussex, and he hoped that at the same time they would leave behind something that might do good.

THE INTERNATIONAL DAIRY CONGRESS, 1907.

Report by F. J. LLOYD, F.C.S., the Society's Consulting Chemist and Delegate.

The Third International Congress was opened at The Hague, or more correctly at Scheveningen, on the 16th September, in the presence of the Prince Consort of Holland.

The Congress was attended by many hundred delegates coming from all parts of the world, and, for the first time, the delegates from Great Britain were fairly numerous as compared with former years, but still far too few to properly represent the enormous interest which this country has in questions relating to the Dairy Industry.

At the opening of the Congress there was an address of welcome on the part of the Minister of Agriculture. This was replied to by Professor Dr. Wijsman, the President of the Committee, then by Baron Peers, the President of the International Federation. Subsequently, papers were read by eminent men on important subjects, but these prolonged the opening ceremony to an inordinate extent, and tired out most of the delegates. This was the only fault that could be found with the arrangements of the Congress from beginning to end, otherwise it was a masterpiece of organisation. In my opinion, it would be far better if at the first meeting a little more time might be given to general questions, and special papers be read at the opening of the sections to which they properly belong.

The subjects to be discussed were divided into three sections: the first dealing with "Legislation and Regulations," the second with "Hygiene," which had a sub-section for "Veterinary questions," and the third section dealing with "Industry." This sub-division is inevitable, but is none the less annoying to those who are interested in two or three subjects which are being discussed simultaneously in different sections. There is only one course for a delegate to adopt, and that is to keep to one section, so far as possible, throughout the Congress. Then to arrange with a friend or friends that they also shall keep to one section, and meet each day subsequently to report and discuss progress. When, as I hope it may be some day, the English delegates are properly organised, this course should be adopted. There is another point which we should also take into consideration, and learn from our foreign friends how to carry it out. Englishmen are not brilliant linguists, and as at an International Congress French and German are probably the principal languages spoken, it is essential to thoroughly understand these if one is to fully comprehend the tenor of the debates and resolutions. Now the French and German delegates adopted the excellent plan of having an honorary secretary in each

section who was able to fully understand the two languages, so that immediately after a speech in German the French Secretary gave a résumé in French, while immediately after an important speech in French the German Secretary gave a brief résumé in German. The English Committee should certainly try and arrange at a future Congress to have an honorary secretary in each section, who could do as much for the English delegates as was done for the French and German delegates by their honorary secretaries. The next Congress will be held at Buda Pesth in 1909, and there is ample time for proper arrangements to be made, but someone must move in the matter, and unless the Board of Agriculture are willing to form an English Committee under their auspices, then the British Dairy Farmers' Association, as representing the Dairy Industry of this country, ought to take the matter in hand.

We may now consider the work done in each section, and this, perhaps, will best be accomplished by taking the resolutions finally adopted by the Congress, and studying them where necessary a little in detail.

FIRST SECTION.

In the first section—Legislation—the following conclusions were adopted: The first question discussed was mainly confined to the methods of analysing milk, butter, etc. It was finally decided that the methods of analysis ought to be uniform in all countries, and that the method of Leffmann-Beam, *i.e.*, saponification in glycerine, should be adopted for determining the amount of volatile acids present in butter-fat, or, as it is technically termed by chemists, the Reichert-Meissl number.

The second question, or more properly "subject," considered related to uniformity of methods in the control of milk and its sub-products (other than butter and cheese) at places where made and sold. Only two papers were presented, as the subject did not seem to attract much attention, but the following resolutions were passed: "It is necessary that the control of milk should be effective from the time it is drawn to the time it is sold or consumed, and that this control should be based on the principle that, while not prohibiting the sale of any milk, there should be a distinction drawn between pure milk of different qualities."

The third subject, the control of butter, is one which always raises a lively discussion, and which is likely to do so for some years to come. The special characteristic of Holland has been the development of control stations to ensure the purity of the butter made and exported. Other countries, such as Belgium, insist upon the addition of both starch and sesame oil to all margarine or fats which might be used to adulterate butter. These countries have, therefore, attempted to boycott all butter coming from countries which do not adopt one or other of these precautions, and they induced the Congress to pass the following resolutions: "That the

nations represented at the Congress should prohibit the entry, first, of butter coming from a country which did not adopt one of the two previously mentioned systems of control; and, secondly, of butter which was not provided with the mark of control, should it come from a country possessing an efficient organisation for control."

Our method in England, as is well known, is to admit substances from any country, and to make sure ourselves that these substances are what they pretend to be. Hence it is evident that England cannot adopt this resolution. The English representatives therefore expressed the opinion "that there is no guarantee against the importation of adulterated butter except by prohibiting the importation of all butter which had not been made under the control and inspection of the Government of the country of origin." It was a kind of polite way of saying we did not think their system workable. In my opinion, there is only one way out of the difficulty which at present arises, and which may be expressed thus: Pure butter should give certain results when examined chemically, and the largest proportion of butter made in all parts of the world does give these results. But there are undoubtedly certain butters which, though genuine, do not give these figures, but figures which under ordinary conditions would represent adulterated butter. Ought we to permit such butter to be imported into this country? I think not. It may be genuine, but it is not of the standard of quality which we ourselves are compelled to produce; hence it should be kept in the country of origin, and not exported into, nor permitted to be imported into, this country.

The fourth subject was the question of cheese control. As in everything else, so in cheese—adulteration is rampant. Cheeses are made of skim milk and sold by the name of those which should be made from whole milk. That this is practised in Holland I know from experience, for I have had to condemn many samples of Dutch cheese sent me by importers as not being made of whole milk. It is evidently well known in Holland that this practice exists, hence several papers were presented to the Congress dealing with the subject, and it was proposed that any cheese which ought to be from whole milk should not be considered as so made unless it contained fat equal to 40 per cent. of its dry matter. In my opinion this figure is too low, and would result in legalising fraud rather than preventing it. In all whole milk cheeses the fat amounts to more than 50 per cent. of the total solids. From other papers it would appear that the practice of manufacturing filled cheese is not yet abandoned—a subject which should not be neglected by our public analysts.

The fifth question was thus expressed: "The inspection of dairies, by whom should it be carried out, and what are the objects to be attained." The following conclusions were adopted by the Congress:—

"First, considering the importance of public hygiene, and the principles recognised in relation thereto, the Congress considers that the inspection of dairies from a hygienic point of view should be general. That one should, however, at first or simultaneously educate those interested, and encourage them to adopt all necessary precautions, while supervision should be obligatory, and gross negligence severely punished.

"Secondly, considering the great importance of such measures to the dairy industry from an economic point of view, that in those countries where it would accord with the ways of the people, the public authorities should intervene to make these regulations obligatory; while in countries where such intervention is impossible or unpopular, it is desirable for the dairies themselves to organise a service of control as universal and complete as possible, and that public authorities ought to encourage such control by subsidies, and help in the carrying out of their instructions. Also, that it is necessary to organise frequent meetings of the persons charged with the duties of this control, to fix general principles of action, and, so far as possible, a certain unity of action and organisation, both technical and economic."

I was much struck with this (in my opinion) advance in the views of the delegates, many of whom came from countries where it is expected that the State will take all such matters in hand. We, too, might take a lesson from this advice, not to force by legislation upon dairy farmers those principles of hygiene which, however desirable, cannot be put in practice in a moment. What is first needed is education. The farmer cannot milk all his cows, cannot always superintend the milking, cannot alter at once the conditions which exist on the farm and under which that milking must take place. He is dependent upon a number of people very far from educated, upon conditions which have existed for years past, and which neither he nor his landlord is in a position to alter at once. The increase in the demand for milk has outrun the conditions for its production under the best possible sanitary arrangements, time is required to secure these, and above all things education. If any attempt is made to go too fast it will simply result in the destruction of our at present most profitable branch of agriculture.

SECOND SECTION.

We may now pass to a consideration of the second section of the Congress: that which was devoted to hygienic questions. I dare not attempt to record all the varied opinions expressed by the many readers of papers, views many of which were, in my opinion, not sufficiently supported by facts to justify their being accepted generally.

The first question was as to the conditions which ought to be realised in the sale of milk, wholesale and retail. Messrs. Silz and Kolm-Abrest, of Paris, went so far as to consider that all milk

should be pasteurised, even though it came from perfectly healthy cows, and that milk coming from tuberculous animals was not safe even if it had been sterilised. Such extreme views one need scarcely say met with little sympathy. Others suggested that all milk sold should be filtered, pasteurised, refrigerated, placed in bottles, and kept cold up to the moment of sale—a suggestion as unpractical as it is unnecessary.

The second question was, "what are the conditions to which milk should conform if intended to be used in a natural state, especially when used as food for children." A short but very able paper on this subject was presented by Francis Marre, of Paris, in which he said, what so many forget, "that science is not made up of opinions and theories but of facts," and "in the present state of science it is impossible to give a reply to this question which shall be precise and final." How very different to this is the advice given in another paper: "Before milking, the under body of each cow should be very carefully brushed down." This same author, having carefully mapped out a most impossible system of milk-production, seems at the end to have realised that this cannot be done without augmenting the price of milk, so he naively adds: "Considering its high nutritive value, the price of milk is far below that of any other food; one should therefore anticipate a rise in the price of milk." Dr. Collingridge, of London, who contributed a paper on this question, was also of opinion, like the last author, that the cows should be cleaned and *brushed* before being milked. Surely Dr. Collingridge ought to know that nothing is so likely to fill the atmosphere of a cow-house with germs of dirt and maybe disease as the brushing of a cow, and if this were done before milking I do not hesitate to say, the milk would be infinitely worse, from a sanitary point of view, than if the animals had not been brushed. What cleansing takes place should be done with a damp cloth or sponge, and every effort made to keep down the dust in the milking space. The conclusions finally adopted by the Congress were as follows:—

"That the veterinary, the chemical, and the bacteriological control of milk should, so far as possible, be general. That the retail trade in milk must be confined to specially licensed premises in which no other articles are sold than milk, or food products which are not detrimental to the milk. That producers and consumers in all countries should be convinced of the necessity to avoid all sources of infection of the milk. That milk destined for consumption in its raw state, and especially by infants, must be supplied from healthy and well-fed cows which have been milked dry; further, that it should be well cooled after milking, and be of normal composition. That public authorities should endeavour to eradicate tuberculosis, and for this purpose should institute veterinary supervision of cattle as well as hygienic supervision of the cow-houses, and medical supervision of the persons charged with the milking and the manipulation of the milk at the farms."

In the veterinary sub-section, another subject was discussed which is likely to be much before the public in England ere long, and on which it is desirable that correct and reasonable views should be held. This question was "the sanitation of cow-houses in connection with the production of milk." No less than eight papers were presented to the Congress dealing with the question. But these papers call for no special notice, as the objects which they were written to attain are summed up in the conclusions of the Congress, which were as follows:—

"That cow-houses should be constructed according to hygienic requirements. That to encourage the improvement of cow-houses it is highly desirable that cow-house competitions should be established. That, besides having hygienic cow-houses, it is desirable that the milk-producing animals be afforded ample opportunity for open-air exercise. That legal prescriptions should be made for the construction of cow-houses, and to safeguard the hygienic side of the production of milk in general. It is desirable that in all countries the building of new cow-houses be not allowed except on condition that they answer reasonable hygienic requirements. The Congress is of opinion that cow-houses should be constructed in such a way that the prophylaxis (prevention) of disease in general may be possible, more particularly to guard against diseases of the udder, and to prevent their development. The best method of housing cattle is that adopted in Holland, namely, with a raised flooring. It is recommended that the cow-houses be subjected to disinfection with lime-water. The Congress is of opinion that the veterinary control of cow-houses and milk-producing animals must be considered as of great importance from a hygienic point of view. It ought to be compulsory in those countries where legal regulations exist. This control must be exercised as frequently as possible, and not less than every three months."

In these recommendations there is one point of great importance to which I should like to draw especial attention, namely, that the Congress would insist upon the building of new cow-houses being in accordance with hygienic requirements, but do not, as some people seem to desire in England, demand these hygienic conditions in the old cow-houses which already exist.

TUBERCULOSIS.

The subject around which most interest centred was that of Tuberculosis and its relation to the dairy industry. This subject was discussed under various heads in different sections, but for the purpose of obtaining a general view of the results arrived at it will be best to consider them together.

The paper which I contributed to the Congress, with a view mainly of soliciting information on definite points, is published at the end of this report, and may serve as a basis for our study of the work of the Congress. Of the papers presented to the Congress bearing on these points, by far the most valuable and moderate

was, in my opinion, that of Dr. J. Poels, the Director of the Serotherapeutic Institute at Rotterdam. This institute is a Government establishment for the suppression of animal disease. The work which it has done and is doing is excellent, and deserves to be most carefully studied by any Government wishing to effectively interest itself in the suppression of disease. Dr. Poels thus had exceptional opportunities of studying the subjects on which he wrote, and his views deserve most careful consideration. They were moderate, not in any sense extremist's views, and in this respect were in striking contrast to those put forward by some speakers, who having had probably less experience were able to give the reins to their imagination.

On the question of the communicability of the disease from animals to man, Dr. Poels appears to be quite in accord with the statement made in my paper. He quotes Dr. A. Weber, in stating that: "An actual case of tuberculous consumption in the lungs by the bovine *tubercle bacilli* has never been met with." Granted that infection is possible from animals to man, more especially to children from the bacilli in milk, is this the main danger, and what is its extent? Dr. Poels says: "In children the bovine tuberculosis is often disposed to recover itself," and again, "the bovine *tubercle bacilli* injurious to childhood appear to have little connection with the surprising death-rate from tuberculosis observable among men of more than 20 years of age." Dr. Poels next passed to the consideration of the seventh question, around which the debate was centred, and which may be thus put: "Is the milk of cows which react to tuberculin dangerous?" In his opinion, the answer to this question is decidedly negative: "Considering that cattle with insignificant tuberculous spots in a gland may respond very actively to tuberculin, we must acknowledge that our fears with regard to the milk of such cows are not justified." He considers that if a well-qualified veterinary surgeon cannot detect clinical symptoms of disease the milk of such cow is probably safe. We can easily understand that with such views expressed by the man who, more than any other in Holland, is capable of forming an accurate opinion on this matter, the views of Dr. Guerin, of Lille, who may be taken to represent the extremist party, found but few supporters. This author came to the conclusion, formerly propounded by Professor Monssu, "That every tuberculous cow without any exception should be excluded from dairy use."

The President of the Veterinary Sub-Section (Dr. D. A. De Jong, of Leyde) was, however, strongly of opinion that inspection, even by a well-qualified veterinary surgeon, was not sufficient; and after an animated debate, partly, I think, out of respect to the President rather than from conviction, the following resolutions were passed:—

1. The elimination of animals having tuberculosis of the udder, and other clinically discoverable forms of disease, is the most important method of preventing infection by milk.

2. If one desires milk which is absolutely inoffensive as regards tuberculosis, it is necessary to obtain it from animals which are exempt from tuberculosis, that is to say: (a) Which do not show any symptoms of this disease; (b) which do not react to tuberculin; (c) which are not lodged in a contaminated cow-house. Further, if the milk coming from animals which react to tuberculin is sold to the public, in the case where one desires the milk to be quite harmless, it is necessary to submit it to sufficient heating before it is consumed.

Personally, I consider that these views go further than is necessary, so also did many others present who were more qualified than myself to judge, but we were out-voted. Those who desire milk absolutely harmless may wait long to get it, for, in the opinion of many, the very heating here recommended would itself render the milk harmful. Meantime, in the main section on hygiene, more reasonable views were being expressed, which finally resulted in the following conclusions:—

Milk coming from dairies which have at their command healthy animals, and in which all the necessary hygienic precautions have been adopted, may be supplied raw; but from a general sanitary point of view, as well as with regard to tuberculous infection, the Congress recommends the use of milk which has been sterilised, or sufficiently boiled or pasteurised, by methods the efficiency of which has been scientifically proved, having due regard to the varying power of resistance observable with the *tubercle bacillus*.

The Congress recommends the method of Dr. Bang for combatting tuberculosis in cattle where this is applicable. Moreover, Dr. Ostertag's method of combatting tuberculosis in cattle by removing such animals as are clinically affected, and by breeding calves free from tuberculosis, is practicable in all countries, and it is imperative that the public authorities take effective steps towards this end without delay.

The elimination of animals which are acknowledged to be clinically affected with tuberculosis, and the breeding of calves free from tuberculosis, retains its value, even if the expectations, based on preventive inoculation against tuberculosis, may be realised.

There were two other questions which I raised in my paper, the first of which was the value of tuberculin. The celebrated authority, Dr. Arloing, of the Veterinary School of Lyons, took up this question in the address he gave on the opening day of the Congress. People are afraid, he thinks, of the revelations of tuberculin, as they do not wish to discard all the animals in the country. To justify this attitude, they contest its scientific value, pretend that it reveals lesions which are healed, that it favours the extension of tuberculosis, that it renders the milk dangerous, etc. All which statements he refutes. That it has in the past given at times very discordant results he attributes first to the absence of

general regulations as to the practice of inoculating with tuberculin, and secondly to fraud, or means having been taken to reduce the susceptibility of animals to the tuberculin. After fully discussing the subject, he comes to the conclusion that the indications of tuberculin (properly applied) are exact, and that our scientific knowledge is not sufficiently developed to enable us to explain the few cases which appear to be erroneous.

The question which I had raised as to the value of vaccination against tuberculosis was not taken up at the Congress, but as I knew that Dr. Arloing was an authority upon this subject, I spoke to him thereon. He informed me that he considers the experiments so far conducted are most satisfactory, and that there is a great future for this method.

Dr. Ostertag, the great German authority, in the address he gave to the Congress on "The Suppression of Tuberculosis," did not speak favourably of this method, but considered that it needed further investigation. He puts his faith more in the separation of diseased from healthy cows, which is the system of Dr. Bang, of Copenhagen, and has been adopted with success in Denmark. Ostertag, however, would not, like Bang, utilise tuberculin as a means of estimating whether the animals were or were not diseased. He recommends his own system of isolating primarily those animals which are suffering only from open lesions, which can be discovered by careful clinical and bacteriological examination, animals with other varieties of the disease, or closed lesions, not being in his opinion sufficiently important to need separation. Of course, he agreed with all other authorities, that the calves should be immediately taken away from the mothers and reared separately where the mothers were suffering from tuberculosis.

Both these eminent authorities recognised the difficulty which there is, and must always be, in attempting to apply these desirable regulations to the whole of the cattle in a country. It is, however, desirable that we should first realise what are ideal conditions, and then we shall be in a better position to consider how far these conditions can be put into practice.

THIRD SECTION.

The third section of the Congress was devoted to the consideration of questions more closely related to the industry of dairying.

The first question was as to the use of pure cultures, or what we call starters in the manufacture of butter and cheese, and some most valuable reports were contributed by men like Dr. Van der Zande and Mr. Bockhout (of Hoorn), Professor Maze (of the Pasteur Institute), and Dr. Weigmann (of Kiel), while men like Professor Böggild, etc., took part in the debates. The work of the section was thus of immense interest, and while it is impossible to follow

closely all the scientific and practical points raised, these may to a large extent be gathered from the resolutions finally adopted, which show the points on which nearly all authorities agree.

The old question as to what bacteria produce the ripening of cheese naturally came up for a certain amount of debate, and the view which I have always held, and which I reiterated again at the Congress, seems to be now more generally appreciated, namely, that the ripening of each variety of cheese must be studied by itself, and apart from the consideration of other varieties: what is true of one variety will not be true of another. But it appeared to be generally recognised now by all authorities that the primary ripening in all varieties of cheese may be attributed to the lactic acid bacillus. What changes subsequently take place, and how and why the characteristic flavour of each variety of cheese is produced, cannot yet be stated, and will need long continued research on the part of many workers.

The second subject debated was the causes which influence the proportion of water in butter. On the third question, the preservation of butter, Mr. Loudon M. Douglas read a paper pointing out the value of "refrigeration in the dairy." And lastly, some papers were contributed on the results obtained by the application of various methods for improving the quality of butter. The conclusions finally adopted by the Congress were as follows:—

That the use of ferments as pure "cultures" is essential for the rational manufacture of butter, because it permits the cream being ripened with certainty and method. That as a rule it is absolutely necessary to use for these "cultures" only such ferments as have been prepared in the laboratory under the stringent rules practised by the bacteriological expert. That it is essential for the age of the cultures to be stated, because of the rapid attenuation (deterioration) which the milk ferments suffer under different physical and chemical conditions. That in order to make experiments in cheese factories, it is necessary to use pure cultures, and to eliminate beforehand all the detrimental ferments present in the milk. That it is desirable to carefully determine the nature of the ferments used and the quantity which should be added. That the pasteurisation of milk intended for cheese-making must be carried out with special precautions as regards the method of heating. That it is absolutely necessary for the laboratory to give every assistance to cheese-makers, while the makers should feel assured of finding collaboration and help from science, which has never hitherto been withheld.

The Congress is of opinion that the factors which influence the quantity of water in butter are chiefly:—

- (a) The temperature when churning.
- (b) The size of the butter grains prior to the removal of the butter-milk.

- (c) The condition and treatment of the cream (pasteurisation, fermentation, acidity, concentration).
- (d) The method of working the butter (kneading and salting).

The Congress accepted the conclusions formulated in a paper by M. Mazé, and urges dairy instructors and industrial men to keep them well in mind, and consider them carefully, in order to thoroughly grasp the principles upon which are based whatever progress the butter industry may still realise. These conclusions are as follows :—

1. The butter industry, if properly conducted, is capable of producing regularly good butter.
2. Its cream separators ensure a full output : its refrigerating machines permit the exact temperature to be obtained which best suits the method of working.
3. Its steam generators facilitate the cleansing and sterilisation of all apparatus and implements.

But we are not yet perfectly certain as to the best method of securing a perfect process of fermentation. Among the unfavourable factors may be mentioned :—

- (a) The insufficiency of pasteurisation, which is often carried out in a manner opposed to the principles of bacteriology.
- (b) The bad quality of the “starters” supplied by the trade, and especially their deficient activity.
- (c) The bad quality of the water used for washing the grains, which frequently causes the butter to become rancid.
- (d) The lack of any system of controlling the efficiency of the pasteurisation, the purity of the fermentation process, and the sterilisation of the appliances used in the dairy.
- (e) The ignorance of the workers, who are frequently unacquainted with the meaning of infection.
- (f) The carelessness of the farmers, who do not carefully follow the advice given them, or recognise the advantage of cooling the milk immediately after milking.

Such is a very brief résumé of the work of the Third International Dairy Congress. The enormous field of investigation and of practice covered by this work, coupled with the fact that the Congress was attended by nearly 900 members, shows that the dairy industry is looked upon as one of the most important branches of agriculture, not only in this country, but throughout the world.

HOW CAN TUBERCULOSIS BEST BE ELIMINATED FROM DAIRY HERDS OF A COUNTRY?

By F. J. LLOYD, F.C.S., F.I.C., Consulting Chemist and Dairy Bacteriologist, British Dairy Farmers' Association.

The Second Interim Report of the Royal Commission on Tuberculosis supplies evidence which seems to justify the following conclusions :—

1. That the tubercle bacillus of man and that of bovines, though slightly different, are closely allied varieties of the same species.

2. That the bovine bacillus is capable of infecting man either in the cervical or mesenteric glands.

3. That tuberculosis thus set up may spread to other parts of the body.

It would, therefore, seem imperative upon every Government to take such steps as might be in its power to eliminate this disease of tuberculosis from the dairy herds of the country, and, for that matter, from all bovines used for human consumption. But I think we may take it for granted that the dairy herds first need attention, if for no other reason than the fact that while meat can be inspected, and in England is invariably cooked before being consumed, milk cannot be inspected before being sold, and is consumed mainly in a raw condition. If, then, by any reasonable steps it is possible to free the herds of a country from this disease such steps ought to be taken, and, in my opinion, no country is better placed to make this experiment than England, owing to her isolation and the facility with which she can exclude cattle, and hence preclude the re-introduction of the disease from neighbouring countries.

The number of people who die from tuberculosis of the cervical or mesenteric glands in England, so far as statistics enable me to estimate, is under 6 per cent. of those who die from tuberculosis, and as the Royal Commission found the bovine bacillus in about 50 per cent. of the cases they examined, we may take it that only 3 per cent. of the deaths from tuberculosis can at present be put down to infection from milk or meat. Even supposing that future investigation may prove these figures too low, yet we must all agree that there is no need for hasty, extravagant, or destructive legislation, such as would paralyse the dairy industry. We must go slowly, for, as I shall point out later on, we are not sure that our efforts will be attended with success.

In attempting to solve this problem, three main facts must be borne in mind. First, that so far as milk is concerned, there is

no danger of its producing tuberculosis unless it comes from a cow suffering from tuberculosis in the udder. Hence the first step must be to destroy all cows having tuberculous udders.

The second point to consider is the well known fact that tuberculosis of the udder is only a final stage of general tuberculosis of the body. Hence, to prevent the recurrence from time to time of diseased udders, it will be necessary to gradually destroy those cows which suffer, however slightly, from the disease, while retaining in the herds only those which are free from the disease. Thus it will be necessary to determine which animals are free from tuberculosis and which are not, and so far as I know the only possible way is by the use of the tuberculin test. But, unfortunately, in England there is a strong feeling against this test as being unreliable, and as having led to the slaughter of many animals which were subsequently found free from the disease. I am of opinion that this Congress might materially assist us if the value of this test could be discussed, and at the final Congress a resolution be submitted for approval, which should summarise the general opinion of this international assembly.

Thirdly, it is evident that if there is to be a gradual destruction of tuberculous cows, steps must be taken to replace them with young cattle not only free from the disease, but likely to remain free. Something might be done to rear such stock where a regular system of isolation could be carried out. But it seems to me that far more could be done if the process of vaccination with bovo-vaccine can be relied upon. As yet, so far as I know, no experiments have been carried out in England with this new method. The results obtained in France with one or two exceptions appear to be most satisfactory, and the recent report of the Royal Commission on Tuberculosis may explain why there have been some failures, if we assume that perchance in those experiments the vaccine was taken from human beings suffering from bovine tuberculosis. This source of error will soon be overcome if my supposition is correct. I trust, however, that some definite expression of opinion as to the efficacy of bovo-vaccine may be made to the Congress by those who have had experience therewith.

Such, then, appear to me to be the absolutely essential conditions of any attempt to control this disease: slaughter of cows with tuberculous udders; discovery, isolation, and gradual elimination of cows suffering from the disease; and the rearing of calves free from the disease, and to a certain extent immune from the disease.

It has been said that tuberculosis could be got rid of if only the cows were kept out on the pastures all the year through. Whether this would be so or not is doubtful, but it cannot be done. It is certain, however, that the longer cattle are kept out on the pastures, and the greater the air space which can be given to them when housed, the healthier they are. But such methods, while they may diminish the amount of disease, would not eradicate it. Can it be eradicated? This is a most difficult question, and one the answer to

which must depend upon the future. That there will be difficulties is certain, and to my thinking, even the grass when the cattle are upon the pastures may prove a source of infection if the germs are brought on to the grass by animals which are also liable to tuberculosis, such as rabbits, etc. Perchance some of my hearers may have experience upon this all important subject.

It is, however, imperative that some steps should be taken to deal with the disease. Having pointed out what steps might be taken, the next question is, who is to carry them out? As the public will benefit from the purification of the milk supply, and as the farmers must invariably be losers, it seems to me only fair that the public should pay within reasonable limits for the loss sustained by the farmer. Whatever is done must be done simultaneously over the whole country, and therefore must be done by general legislation. Full compensation for cows suffering from tuberculosis of the udder should be paid for a limited number of years, then the compensation should gradually diminish, for with proper care there should then be very little chance of cows suffering from tuberculosis of the udder; and if proper care were not taken, the farmer ought not to receive full compensation. The Government should prepare and supply both tuberculin and bovo-vaccine of standard quality and purity, and supply them to qualified veterinary surgeons free, or at a nominal cost. Such surgeons should be bound to report every case in which they had been used. Simultaneously it should be made illegal to import, sell, manufacture, or use, either tuberculin or bovo-vaccine. Every county council should endeavour to discover and stop the supply of milk containing tubercle bacilli, and assist the farmer to discover any cows suffering from tuberculous udders. At the end of five years a penalty might be attached to the sale of such milk, whether it were done intentionally or not; and at the end of ten years, compensation for cows with tuberculous udders should cease, or be greatly diminished, according to the success which had attended the efforts of the Government to diminish tuberculosis in the herds. Such appears to my mind a feasible plan of attacking this great international problem, for it is not England alone which should take this action, but every civilised country where tuberculosis is prevalent. That it will be possible to exterminate tuberculosis from the herds I doubt: that it may be possible to materially diminish this source of human consumption I believe. But we must never forget how small is the proportion of consumptives who obtain the disease in this way; and if while dealing with this source of the disease we neglect other sources, especially a contaminated atmosphere in our homes and public places, we shall find that, while an enormous sum of money has been expended to benefit our herds, the number of human beings who suffer from this terrible disease has increased by leaps and bounds, owing to the neglect of other and far more serious sources of infection.

THE SECOND NATIONAL POULTRY CONFERENCE.

By L. C. VERREY, The Warren, Oxshott, Surrey.

After a lapse of eight years the Second National Poultry Conference was held at Reading on July 8th to 12th, 1907, and far exceeded its predecessor in importance and popularity, for during the interval marvellous developments have occurred in all matters concerning the poultry industry, which were amply testified and demonstrated during the four days of the Conference. The title of "National" was perhaps somewhat of a mistake, inasmuch as the Conference was really far more "International" in its character, comprising as it did papers and discussions by eminent and distinguished foreign and colonial specialists, as well as those by the best known authorities in the United Kingdom.

Undoubtedly quite as much interest is taken in this part of our agricultural industry abroad as at home, and Sir Thomas H. Elliott, K.C.B., in his inaugural address, said: "We are only at the beginning of international co-operation in agriculture. I know something of movements now proceeding on the Continent of Europe, and in newer countries, towards greater co-operation on the part of agriculturalists in the various countries of the world. And on occasions like these, when we have the opportunity of meeting distinguished foreign agriculturalists, we are advancing in a considerable measure that international co-operation in all matters concerning agriculture, and in regard to which personally I am convinced we have a great future in front of us."

The organisers of the Second Poultry Conference are to be congratulated on all the arrangements and the excellence of the lengthy programme, which embraced papers on nearly every subject connected with the poultry industry, besides an exhibition of English and Foreign live poultry, a very fine display of eggs from all countries, and a most interesting collection of dead poultry in the Reading Ice and Cold Storage Company's plant. The delegates and members had nothing to complain of in regard to the abundance of the subjects submitted, or their variety, the only unfortunate part being that so many highly interesting papers were being read at the same time in various parts of the extensive University College, and, with so many things going on, it was impossible for one to thoroughly appreciate all that was being done to further the advancement of poultry culture.

The programme was divided up into six sections, lettered from A to F. In the first, some of the most interesting papers were those that dealt with "Observations on Moisture and Ventilation in Incubators," "Modern Methods of Chicken Rearing."

and "The Keeping of Fowls Permanently on Arable Land"—all of which are topics of vast importance to the poultry raiser; and the experience of the writers, as set forth in these papers, cannot fail to be of benefit to all interested.

In Section B a most interesting paper was read on "Mendel's Law of Heredity and its application to Poultry Breeding." Naturally, as the title indicates, this was a scientific discourse on the law of heredity, and was further explained by diagrams. There is no doubt but that the experiments which have been carried out respecting heredity have shown satisfactory results, but it remains a question as to whether the average poultry breeder would at present find the Mendelian law of service to him in the mating up of his stock. Possibly, when more definite rules are obtainable as to the results to be derived from various amalgamations, the application of this law may be very helpful to poultry breeders in enabling them to secure and perpetuate certain desired points and characteristics, but as it now stands it is a science that has only just made a beginning. In the same section, valuable papers were contributed on the mating and breeding of several breeds of poultry and ducks, so that much practical information was disseminated to those interested in these particular topics.

Papers were also read on "Experiences in Feeding Poultry," "The Influence of Heredity upon the Diseases and Deformities of Poultry," and others of like nature; whilst in Section D "Women and the Poultry Industry" aroused much earnest attention, for the lady speakers were all well versed in the various subjects of their papers, so that it may be expected that many more ladies will in the future turn their attention to poultry culture. Section E was devoted to Education and Research, and here one heard the results of experimental work carried on at home and abroad. The final section was confined to the commercial side of the question, and though, naturally, several of the papers dealt largely with statistics, the information given was of a most valuable character, and demonstrated the growing importance of the poultry industry, not only in this country, but all over the world, which can only be thoroughly realised and appreciated by a careful study of the facts as set forth in the papers on "The World's Production in Eggs and Poultry," "The British Egg and Poultry Trade," and others of a like nature, read at the Conference.

Much could be written on the value of the information and knowledge derived from listening to the reading of the papers above mentioned, and also others equally interesting; but want of space prevents me elaborating to any length, and to those who would like to further study the various important questions, I must refer them to the official report of the Conference.

Undoubtedly one of the most interesting features of the Reading Conference was the display of British and Foreign breeds of poultry and eggs. The live poultry were staged in two large tents in the grounds of University College alongside of the main

building, whilst the display of eggs was in two of the rooms of the building itself. The show of poultry was on the two last days of the Conference, and differed very greatly from what one knows of poultry shows in the ordinary way, inasmuch as it was non-competitive, all the birds being lent by their respective owners to the Committee, as representative specimens of a male and a female of each breed, so that indeed the display was a unique one in every way, and it can be claimed that never has such a thoroughly representative collection of English and Foreign breeds of domestic poultry been gathered together at one time. As in other departments of the Conference, the show was divided into sections, these consisting of :—I, England; II, Belgium; III, France; IV, The Netherlands; V, America; and VI, Russia.

In the section devoted to the breeds cultivated in the United Kingdom were to be seen examples of all the present-day varieties of fowls, besides several that were warm favourites in days gone by; for instance, a very good white-faced black Spanish cock, and an equally good hen, brought back reminiscences of the time when this breed was at the height of its popularity and the large classes one always saw at the shows. Then again, the white-crested black, and other coloured Polish, recalled the days of yore and the admiration these birds always received, together with another decaying breed—the graceful and ornamental Sultan fowls. To see these old favourites side by side with the modern fancied and popular breeds was indeed most interesting to those who have watched the wonderful development and advance of varieties that were unknown when the old favourites held the sway. The collection of turkeys was very fine, for, besides the American Bronze and Cambridge Bronze, there were Buffs, Blues, Whites, and Blacks—varieties that are by no means common. There were also on view Chinese and Sebastopol geese. From an educational point the display in the British, as well as the other sections, was unique, for never in my recollection has the student in poultry culture had such an opportunity of seeing, and thus being able to compare, the characteristics of nearly every known race of fowls at one time and in such close proximity.

In the Belgium division were to be found specimens of the best known and most cultivated breeds of that country, many of which were strangers to England. The greatest interest was centred in the Bruges game and the turkey-headed Malines, whilst the quaint little Barbu Nain d'Anvers were much admired by the ladies and children. The Blue Termond ducks are pretty in appearance, but small in size, and therefore more suited for ornamental waters than anything else; whilst, on the other hand, the Huttegem, or Laplaigne, are of large size, and undoubtedly are good utility ducks.

For some unknown reason the entries from France did not arrive, which is much to be regretted, as one would have rejoiced

at the opportunity of being able to have compared the French-bred La Flèche and Crève Cœurs with those that are bred here.

The Nederlandsche Hoenderclub contributed a nice collection of eighteen couples of birds in the Netherlands section, the most noticeable being "The Dutch Owl Bearded Fowls," a race of very peculiar appearance, the cock's comb having two rather short horns (something resembling that of the La Flèche), whilst from the lower part of the beak hangs a well-developed beard. The Brabantine are another rather remarkable variety, the plumage being buff-mottled, the cock's head being surmounted with two tufts of feathers, sticking out in horn-like fashion, the hen simply having a white crest. The Brabançonnés are especially curious, the comb of the hen projecting like a miniature fan over the beak. Amongst the other specimens there was nothing calling for special mention. America was to have been represented by some pens of White Leghorns, but, unfortunately, owing to delay in transit, only two pens of these arrived, and then not until the afternoon of the second day.

In Section VI. were to be seen some Arsamas geese sent by the Imperial Society of Moscow, which are commonly known as the fighting geese of Russia, of which there are two varieties or colours, viz.:—the grey (called Tula) and the whites (called Arsamas). There is no doubt about these birds being justly called "fighters," for on two of them happening to get loose they soon sparred up to each other, and a battle would have ensued had they not been quickly separated.

The whole display comprised a total of 155 pairs of birds, worthy representatives of their respective races, thus forming a most remarkable demonstration of the results of scientific poultry culture and the advance made in this branch of agriculture. The display of eggs was capitally arranged, and showed the methods adopted of packing by various countries on the Continent and also Egypt. An hour or so could well be spent in the egg rooms, and judging from the continuous crowding of these rooms it was very evident that the subject of our egg supply is one that creates the keenest interest.

The members and delegates were fortunate in being able to have the opportunity of visiting the Reading Ice and Cold Storage Plant, for there they were shown a very excellent collection of fresh poultry, consisting of fattened Surrey fowls, Welsh and Irish chickens, ducklings, fattened Bordeaux pigeons, and fattened quail. Amongst the cold-stored poultry were to be seen American and also Russian fatted fowls, etc.

During the four days of the Conference excursions were made to places of interest in the neighbourhood of Reading, so that from the commencement of the proceedings until their termination the minds of all present were kept fully occupied.

There can be no doubt but that conferences of this kind, held at intervals of a few years, do an immense amount of good in

furthering the development of the poultry industry, and clearly demonstrate how important that industry is becoming in all parts of the world.

Having the honour to be one of the Delegates appointed by the British Dairy Farmers' Association to the First National Poultry Conference held at Reading in 1899, and occupying a like position at the Conference held last July, I was able to compare the past with the present, and noted with satisfaction with what rapid strides every branch of the industry has advanced, and how universal the study of the matter has become.

FAT IN MILK:

RECORDS MADE AT THE BRITISH DAIRY INSTITUTE.

The appended figures, giving the fat percentage of both morning and evening milk supplied to the British Dairy Institute during the year 1907, should be interesting to farmers generally.

Mr. Lousley's herd consists of about 40 Shorthorn cows, with the addition of one Jersey to every six or eight Shorthorns. The milking hours are at 5 a.m. and 3 p.m. respectively. During summer, when the cows are on grass, they receive about 4lbs. of cotton cake per head per day. In winter the food consists of about two loads of pulped mangolds per day, and straw chaff, with about 6lbs. of artificial food—the latter being a mixture of a compound meal and bean meal—for each animal.

The eleven cows forming the herd on the Farm of the University College, Reading, are all Shorthorns, and the milking takes place at 5.30 a.m. and 3 p.m. respectively. In summer the cows are on the pastures, and receive no artificial food. During the autumn and winter they receive 6lbs. of mixed decorticated and undecorticated cotton cake, with the addition in autumn of cabbage, green maize, and kohlrabi, and mangolds in winter.

PERCENTAGE OF FAT IN MILK RECEIVED AT BRITISH DAIRY INSTITUTE, 1907.

Note.—The milk was not tested on Sundays.

	Milk from Mr. Lousley		Milk from University College Farm	
	Morn.	Even.	Morn.	Even.
January				
17	3.4	4.9	3.5	4.2
18	3.7	4.5	3.6	4.2
19	4.1	4.3	3.7	4.0
21	3.4	4.5	2.8	4.0
22	3.5	4.5	3.3	4.0
23	3.7	4.3	3.7	3.9
24	3.6	4.8	3.2	3.7
25	3.6	4.5	3.4	3.6
26	3.4	4.8	3.7	3.5
28	3.5	4.6	3.4	3.8
29	3.4	4.4	3.3	3.9
30	3.3	4.6	3.2	3.4
31	3.5	4.7	3.2	3.5

		Milk from Mr. Lousley		Milk from University College Farm	
February		Morn.	Even.	Morn.	Even.
1	....	3·6	4·2	3·0	3·7
2	....	3·4	4·5	3·5	4·2
4	....	3·4	4·1	3·3	3·8
5	....	3·6	4·1	3·6	3·9
6	....	3·7	4·1	3·4	3·4
7	....	3·7	4·0	3·2	3·6
8	....	3·5	4·3	3·2	3·8
9	....	3·7	4·4	3·4	4·0
11	....	3·3	4·8	3·4	3·6
12	....	3·2	4·4	3·4	3·8
13	....	3·2	4·5	3·5	3·9
14	....	3·5	4·4	3·3	4·1
15	....	3·1	4·3	3·4	4·1
16	....	3·3	4·2	3·3	3·8
18	....	3·2	4·3	3·4	3·8
19	....	3·6	4·3	3·7	4·1
20	....	3·7	4·2	3·5	3·8
21	....	3·5	4·9	3·6	3·6
22	....	3·3	4·7	3·6	4·0
23	....	3·4	4·8	3·4	3·8
25	....	3·4	4·4	3·3	3·5
26	....	3·3	4·3	3·2	3·8
27	....	3·4	4·5	3·3	3·6
28	....	3·7	4·2	3·3	3·8
March					
1	....	3·4	5·0	3·3	3·4
2	....	3·5	4·4	3·2	3·7
4	....	3·4	4·8	3·1	3·7
5	....	3·5	4·4	3·1	3·6
6	....	3·6	4·4	3·2	3·6
7	....	3·4	4·5	3·4	3·7
8	....	3·4	4·2	3·2	3·7
9	....	3·4	3·9	3·3	3·8
11	....	3·4	4·1	3·3	3·6
12	....	3·4	4·3	3·1	3·4
13	....	3·3	4·2	3·1	3·3
14	....	3·3	4·1	3·2	3·6
15	....	3·4	4·0	3·2	3·5
16	....	3·2	4·0	3·4	3·6
18	....	3·4	3·9	3·4	3·7
19	....	3·4	3·9	3·3	3·7
20	....	3·2	3·8	3·4	3·5
21	....	3·3	3·8	3·4	3·6

	Milk from Mr. Lousley		Milk from University College Farm	
	Morn.	Even.	Morn.	Even.
March (Cont.)				
22	3.3	3.7	3.3	3.6
23	3.5	3.8	3.5	3.5
25	3.3	4.1	3.2	3.6
26	3.4	4.0	3.4	3.3
27	3.3	4.0	3.1	3.5
28	3.3	4.0	3.2	3.5
29	3.7	3.7	3.3	3.5
30	3.3	3.7	3.3	3.4
April				
1	3.1	3.7	3.3	3.5
2	3.2	3.8	3.3	3.4
3	3.4	4.0	3.3	3.5
4	3.3	3.8	3.4	3.3
5	3.4	3.6	3.2	3.5
6	3.4	3.6	3.3	3.4
8	3.2	4.0	3.4	3.5
9	3.3	3.9	3.4	3.6
10	3.5	4.0	3.4	3.6
11	3.5	4.0	3.4	3.5
12	3.4	4.1	3.5	3.7
13	3.4	4.2	3.5	3.5
15	3.4	3.9	3.4	3.5
16	3.4	4.0	3.4	3.6
17	3.5	4.3	3.5	3.5
18	3.6	4.3	3.6	3.6
19	3.5	3.9	3.4	3.5
20	3.2	3.6	3.5	3.6
22	3.2	4.3	3.5	3.6
23	3.2	3.9	3.4	3.3
24	3.3	4.0	3.4	3.5
25	3.2	4.1	3.4	3.7
26	3.4	4.3	3.3	4.0
27	3.4	4.3	3.5	4.0
29	3.4	4.1	3.5	3.9
30	3.4	—	3.5	—
May				
1	3.5	4.5	3.3	4.1
2	3.7	4.7	3.6	4.0
3	3.5	4.6	3.6	3.8
4	3.5	4.6	3.5	3.8
6	3.2	4.1	3.6	3.9
7	3.2	4.0	3.6	3.7

		Milk from Mr. Lousley		Milk from University College Farm	
		Morn.	Even.	Morn.	Even.
May	(Cont.)				
8	.....	3·3	4·4	3·5	3·9
9	.....	3·4	4·1	3·3	3·6
10	.....	3·5	4·2	3·4	4·1
11	.....	3·4	4·3	3·5	3·5
13	.....	3·7	4·5	3·2	3·9
14	.....	3·2	4·0	3·4	3·7
15	.....	3·7	4·2	3·5	3·7
16	.....	3·4	4·1	3·4	4·3
17	.....	3·2	4·0	3·6	4·3
18	.....	3·4	4·1	3·6	3·6
20	.....	3·7	4·0	3·3	3·8
21	.....	3·3	4·0	3·3	3·6
22	.....	3·3	4·2	3·5	3·8
23	.....	3·5	3·9	3·2	3·5
24	.....	3·2	4·1	3·3	3·5
25	.....	3·2	4·3	3·2	3·3
27	.....	3·4	4·0	3·2	3·5
28	.....	3·4	4·2	3·1	3·7
29	.....	3·2	4·7	3·2	3·5
30	.....	3·2	4·0	3·1	3·4
31	.....	2·9	3·8	3·2	3·1
June					
1	.....	3·9	3·7	3·1	3·4
3	.....	3·1	3·8	3·2	3·5
4	.....	3·1	4·2	2·9	3·6
5	.....	3·3	3·7	3·2	3·3
6	.....	3·0	4·0	3·0	3·6
7	.....	3·0	3·7	3·3	3·4
8	.....	3·3	3·5	3·2	3·6
10	.....	3·2	3·9	3·2	3·9
11	.....	3·4	4·4	3·7	3·8
12	.....	3·4	4·3	3·3	3·7
13	.....	3·4	4·4	3·3	3·6
14	.....	3·4	4·0	3·5	3·6
15	.....	3·4	4·2	3·3	3·7
17	.....	3·3	3·9	3·5	3·8
18	.....	3·1	3·8	3·4	3·5
19	.....	3·2	3·9	3·3	3·4
20	.....	3·4	4·1	3·4	3·9
21	.....	3·4	3·9	3·6	3·9
22	.....	3·4	3·6	3·4	3·8
24	.....	3·2	4·0	3·2	3·7
25	.....	3·3	4·0	3·4	3·8

	Milk from Mr. Lousley		Milk from University College Farm	
	Morn.	Even.	Morn.	Even.
June (Cont.)				
26	3.3	4.0	3.2	3.8
27	3.2	3.8	3.4	3.7
28	3.3	4.0	3.3	3.9
29	3.5	3.7	3.4	3.7
July				
1	3.1	4.1	3.3	4.0
2	3.4	4.0	3.6	3.6
3	3.2	3.8	3.2	4.0
4	3.5	4.0	3.4	3.5
5	3.4	3.6	3.4	3.8
6	3.2	4.3	3.3	3.7
8	3.4	4.4	3.4	3.8
9	3.3	4.2	3.4	3.7
10	3.3	4.0	3.5	4.0
11	3.3	4.2	3.5	3.8
12	3.4	4.2	3.2	3.8
13	3.4	3.8	3.4	4.1
15	3.2	4.2	3.5	4.2
16	3.6	4.1	3.8	3.9
17	3.5	4.0	3.5	3.9
18	3.3	4.5	3.6	4.1
19	3.3	4.1	3.5	3.8
20	3.5	3.8	3.5	3.9
22	3.5	3.6	3.5	3.4
23	3.3	4.5	3.4	4.2
24	3.3	4.0	3.6	3.6
25	3.3	4.4	3.5	4.1
26	3.4	4.0	3.4	4.1
27	3.2	4.6	3.6	4.3
29	3.3	4.4	3.4	4.5
30	3.4	4.3	3.6	4.2
31	3.3	—	3.5	—
August				
1	3.3	4.2	3.6	4.2
2	3.4	4.2	3.7	4.3
3	3.4	3.8	3.6	4.3
5	3.2	3.5	3.4	4.4
6	3.1	4.4	3.3	4.4
7	3.2	4.0	3.4	4.0
8	3.3	4.3	3.5	4.2
9	3.6	4.5	3.5	4.0
10	3.3	4.3	3.6	4.5

	Milk from Mr. Lousley		Milk from University College Farm	
	Morn.	Even.	Morn.	Even.
August (Cont.)				
12	3.4	4.0	3.4	4.3
13	3.4	4.5	4.0	4.3
14	3.4	4.4	3.2	4.1
15	3.5	3.8	3.7	4.2
16	3.6	4.2	3.6	3.3
17	3.8	4.5	3.6	4.0
19	3.0	4.0	3.2	4.0
20	3.9	4.6	3.5	4.0
21	3.3	4.0	3.5	3.9
22	3.5	4.6	3.7	4.1
23	3.8	3.7	3.4	4.2
24	3.5	4.1	3.5	4.2
26	3.2	4.4	3.6	4.1
27	3.5	4.1	3.5	4.2
28	3.0	4.3	3.5	4.2
29	3.7	4.6	3.6	3.9
30	3.7	4.6	3.5	4.1
31	3.8	4.6	3.6	4.3
September				
2	3.8	4.6	3.7	4.7
3	3.7	4.5	3.6	4.0
4	3.7	4.1	3.4	4.1
5	4.0	4.5	3.5	3.9
6	3.6	4.6	3.4	4.3
7	3.5	4.2	3.5	4.2
9	3.8	4.4	3.5	4.6
10	3.7	4.6	3.6	4.2
11	4.0	4.7	3.8	4.3
12	3.5	4.7	3.5	4.4
13	3.5	4.3	3.6	4.0
14	3.4	4.0	3.6	4.7
16	3.4	4.7	3.4	4.1
17	3.7	4.8	3.8	4.5
18	3.8	4.2	3.5	4.4
19	3.7	4.7	3.8	4.5
20	3.8	4.8	3.6	4.7
21	3.9	4.8	3.6	4.8
23	3.7	4.2	3.9	4.5
24	3.8	4.8	3.4	4.4
25	3.9	4.6	3.6	4.2
26	4.3	4.7	4.0	4.6
27	3.9	4.7	3.7	4.4
28	4.2	4.7	3.6	4.3
30	3.8	4.6	3.6	4.3

	Milk from Mr. Lousley		Milk from University College Farm	
	Morn.	Even.	Morn.	Even.
October				
1	4.0	5.0	3.8	4.4
2	3.8	4.5	3.8	4.5
3	3.4	4.7	3.8	4.3
4	4.2	4.7	4.0	4.5
5	3.7	4.3	3.8	4.5
7	3.6	4.6	3.6	4.4
8	3.9	4.8	3.6	4.5
9	4.0	5.0	3.7	4.8
10	3.6	4.7	3.8	4.7
11	4.0	4.8	3.8	4.6
12	4.0	4.7	3.9	4.7
14	4.2	4.7	3.9	4.7
15	3.9	4.9	3.7	4.3
16	4.3	4.6	3.9	4.9
17	4.1	4.5	3.9	4.7
18	3.5	4.9	3.7	4.5
19	3.9	4.5	3.7	4.2
21	3.8	4.8	4.2	4.2
22	3.8	4.8	4.1	4.4
23	3.8	4.8	3.9	4.0
24	3.7	4.9	3.7	4.5
25	3.7	4.9	3.5	4.0
26	4.1	4.9	3.8	4.2
28	4.4	5.2	3.4	4.7
29	4.1	4.9	3.6	4.4
30	3.9	4.9	3.5	4.3
31	3.7	5.0	3.6	4.5
November				
1	4.1	5.1	3.6	4.2
2	4.3	4.7	4.0	4.4
4	4.2	5.0	3.7	4.2
5	4.0	5.0	3.5	4.9
6	4.8	4.9	4.7	3.4
7	4.2	4.9	4.4	4.1
8	4.3	5.0	3.6	4.2
9	4.2	4.8	3.6	3.8
11	4.0	4.7	4.0	4.9
12	3.7	4.6	3.7	4.5
13	4.1	5.0	3.5	4.2
14	4.2	4.7	3.8	4.4
15	3.9	4.8	3.5	5.0
16	3.6	4.9	3.9	4.5
18	4.1	4.9	4.0	4.0

		Milk from Mr. Lousley		Milk from University College Farm	
		Morn.	Even.	Morn.	Even.
Nov. (<i>Cont.</i>)					
19	....	4.0	4.9	3.7	4.4
20	....	4.2	4.9	3.8	3.8
21	....	4.2	4.3	3.8	4.1
22	....	4.1	4.6	3.7	4.1
23	....	4.1	4.6	3.7	3.6
25	....	4.0	4.2	3.5	4.3
26	....	4.1	4.4	4.2	4.1
27	....	4.1	4.3	4.1	4.2
28	....	4.0	4.5	4.0	4.2
29	....	3.8	4.9	4.0	4.2
30	....	3.7	4.8	3.8	4.5
December					
2	....	4.1	4.5	4.3	4.8
3	....	3.8	4.7	4.2	4.5
4	....	4.0	4.5	3.9	4.3
5	....	3.9	4.7	4.1	4.4
6	....	4.0	4.5	4.0	4.2
7	....	3.7	4.5	3.9	4.4
9	....	4.0	4.6	3.9	4.7
10	....	4.1	4.4	4.0	4.5
11	....	4.2	—	4.0	—

FURTHER ANALYSES OF CONDENSED MILK.*

REPORT BY F. J. LLOYD, F.C.S., Consulting Chemist to the
British Dairy Farmers' Association.

When I received instructions to make analyses of another five samples of condensed milk, and this time not to confine myself to machine-skimmed milk, I endeavoured to obtain samples of full-cream milk from the same sources as I had obtained the machine-skimmed. It must be clearly remembered that I had not bought these former samples as or knowing them to be machine-skimmed, but had simply asked for the brands of which they sold the greatest amount, and it was only after purchasing the samples that I found in all cases they were machine-skimmed. Now upon attempting to obtain samples of full-cream milk I was met with two difficulties: First, that in many of these places nothing whatever was kept but condensed machine-skimmed milk; and secondly, that after numerous efforts in various places I could only find three full-cream condensed milks on the market. Subsequently I obtained Sample A 89, unsweetened, and also Sample A 88, which I had not previously examined, and which appears to be the cheapest machine-skimmed milk on the market. It is only fair to state that the makers of this brand print on the label surrounding the tin—"Unsuitable for the use of infants and invalids."

As regards the composition of the samples themselves nothing need be said, they all represent milk reduced to about one-third its volume, so that to bring it back to the richness of ordinary milk as regards fat and other solids, one part of these milks could be mixed with only two parts of water. It will be seen that even taking the first two samples, 45 ounces of milk would cost 5½d. i.e., for a little over a quart of milk, which is a much higher price than the same quantity of milk can be bought for in a fresh condition. There can, I think, be no doubt whatever that the people who use condensed milk dilute it to such an extent that it becomes practically a mixture of equal parts of milk and water. Indeed, on one of the tins the directions state that for puddings, coffee, tea, etc., the milk may be diluted with four or five times its volume of water.

The Society might endeavour to discover how far the condensed milk used in or imported into England consists of full-cream or machine-skimmed milk. I think also that some steps should be taken

* A previous report on this subject was published in this Journal,
Vol. xxi., pp. 163-170.

to draw the attention of the medical profession to the composition of condensed milk, and to the danger which must arise from infants being fed upon it. Probably much of the ill-health among children, frequently attributed to the consumption of impure fresh milk, if investigated would be found to be due to the use of condensed machine-skimmed milk. It is very doubtful whether the vast majority of the poor people who buy and use this condensed machine-skimmed milk have any knowledge of what they are using. They simply buy what is cheapest, and make it go as far as they possibly can, without any regard to the health of their infants.

	A 85	A 86	A 87	A 88	A 89
Nature	Full Cream	Unskimmed Swiss	Full Cream	Machine skimmed	Full Cream unsweetened
Prepared in	England	Switzerland	Switzerland	Holland	Norway
Contents of tin	15 ozs.	15 ozs.	14½ ozs.	13 ozs.	12 ozs.
Price of tin	5½d.	5½d.	5½d.	2d	4½d.
Analysis.—Water	18.70	13.04	16.52	26.14	67.72
Fat	9.94	11.13	8.20	1.02	10.13
Casein	10.95	8.37	9.90	8.43	10.86
Sugar, etc.	58.21	65.46	62.54	62.41	9.55
Ash	2.20	2.00	2.84	2.00	1.74
	100.00	100.00	100.00	100.00	100.00
Containing boric acid17	.10	none	none	none

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 London, E.C., September, 1907.

THE DAIRY SHOW OF 1907.

By THE JUDGES, STEWARDS, AND SECRETARY.

The interest shown in the Association's Annual Exhibition was again quite remarkable. This is evidenced by the fact that, for the second time, the list of competitive entries numbered over 8,000, as will be seen from the appended tabular statement:—

	1902.	1903.	1904.	1905.	1906.	1907.
Cattle	224	203	164	182	240	237
Milking and Butter Tests ..	214	186	167	217	247	245
Goats	49	30	46	51	51	48
Poultry	2,617	2,860	2,678	3,068	3,347	3,081
Pigeons	2,500	2,485	2,426	2,440	2,573	2,664
Poultry and Pigeon Appliances.	—	—	—	—	55	65
British Cheese	286	269	250	268	255	420
Bacon and Hams	50	79	46	49	39	57
Butter	571	555	556	641	578	593
Cream	57	59	44	52	42	35
Skim-milk Bread, &c.	93	83	140	121	159	118
Honey, &c.	131	125	122	124	118	67
Egg and Butter Packages ..	—	17	20	—	—	—
New and Improved Inventions	20	24	43	22	17	33
Vehicles for Conveying Milk ..	19	27	25	—	—	—
Roots	190	144	184	170	156	177
Butter-making Contests	162	150	172	206	199	200
Milkers' Contests	46	36	55	66	121	135
	7,239	7,332	7,138	7,677	8,197	8,175

In the Cattle Section, the essential varying from the schedule of former years consisted in the introduction of a separate class for Lincolnshire Red Shorthorn cows, and the inclusion of prizes for cows of any breed or cross, to be used for Milkers' Contests during the Show.

The Shorthorns were undoubtedly a very exceptional collection of dairy cattle. The pedigree Shorthorns showed much more dairy character than is usual in such classes.

The non-pedigrees formed a very large class, containing many animals of great merit—29 in all, which is probably the largest number ever exhibited at Islington. The general order of merit was high. It was a pity in a few cases, however, that otherwise good beasts should lose points by their udders being deficient in shape and character.

The bulls were certainly a stronger and better class than usual. As the dams of these animals are all winners in milking competitions, we expected to find more of that fine touch and skin which betokens a milking strain.

Both classes of Shorthorn heifers were "very good all through," and the same remark was made by the Judge of Lincolnshire Red Shorthorn cows.

The Jersey Classes were well filled, and the type generally was very good indeed.

In Class 6, for cows, the first prize-winner was a really fine cow, full of quality, excellent outline, large well-shaped udder, which, when milked out, felt like a silk handkerchief. The second prize was also an animal of the same type and quality, though her udder was not quite so rich in touch and so even as the first prize animal. The third prize was an excellent type of dairy cow, but she lacked size. Of the remaining animals, many of them showed excellent milking properties, and altogether the class was much above the average.

Class 7, restricted to Jersey heifers bred in Great Britain or Ireland, did not contain many entries, but the first prize animal was quite an exception for dairy appearance, and with luck she must make a very first-class cow for the pail.

Class 8, for Jersey heifers bred in the Channel Islands, was very strong both as regards numbers and quality. The first prize never cast a doubt as to the position she would take with her excellent well-shaped udder, fine touch, full of quality, and good constitution. The second was quite a good animal, with nice style and good udder, and the remaining animals generally showed quality.

Of the Jersey bulls, the first prize one was full of quality and general appearance of producing good dairy stock; he was quite a nice bull, and if he does not fall a little in the back will take a lot of beating next summer. The second prize was not very straight in his outline; and the third, though showing the appearance of good dairy properties, was on the coarse side generally, especially in the horns.

Guernseys were few in number, and although a sum of £43 was set aside for South Devon cows, unfortunately only two entries were forthcoming, so that the class was cancelled for want of competition.

All the Red Polled cows were good; a marked improvement was noticeable in the shape of the udders of these cattle, and the majority of the entries were typical dairy cattle. Eight Red Polled heifers came before the Judge in a remarkably fine class, containing some well-grown animals with capacious udders, more especially the first and second prize winners.

The seven Kerry cows exhibited were useful animals, but no exceptionally fine specimen of the breed could be found.

Of the eight Dexter cows, the two placed first and second, more especially the first, appeared to be typical Dexters, as well as excellent for the dairy.

The Class for Pair of Cows of any breed or Cross, in milk, was a very good one, the first prize pair being of exceptional merit, well matched, with good udders, and symmetry. The Shorthorn Cross was predominant. The second prize was awarded to two very useful dairy cows with good udders, and showing milk in their

appearance, but not so even or well matched as the first-prize animals.

The entries of Single Cows of any breed or Cross were not so numerous as we might have expected, there being only 7 entries, of which two were absent. The first prize animal was an excellent dairy cow in every respect, with size, form, and milking characteristics.

Goats were present in sufficient force to illustrate the different types that are most in favour, the 48 specimens including some very notable ones.

Perhaps the most striking features of the Exhibition was the exceptionally large display of British cheese, the total being over 50 per cent. greater than the average of recent years. This was mainly the result of greater liberality in the prize money, and the inclusion of one or two additional classes,—i.e., a new one for Derby, and two classes instead of one for Cheshire cheese.

One of the Judges of Cheddar observed that the exhibits contained very few really outstanding lots, but were on the whole satisfactory. The principal defects were looseness of texture and too much acidity, both resulting, no doubt, from the cold wet weather experienced in 1907. In the class for four cheeses the first prize lot was an almost perfect exhibit, and the same may be said of the first and second prize twenty's; but the Loaf Class was very disappointing, it being difficult to select a first-class exhibit.

Some few lots in the twenty's were very inferior in quality, and pitched apparently more with a view to sale than with any hope of a prize.

Cheshires were well represented by most of the best makers, the increased number of entries amply justifying the Council in providing separate classes for coloured and uncoloured cheese, there being 55 entries of the former and 25 of the latter.

Of Wensleydales (Stilton-shaped or flat) there were 14 entries. These cheese, like the Stiltons, had been affected by the changeable summer, and were all more or less sweet, and inclined to be brown.

None of the Leicesters (4 cheese) exhibited were up to the "Lester" standard, and several were very poor samples indeed, being very open, sweet, and off colour.

With two or three exceptions, the Stiltons with 8 cheese in each entry were not up to the mark, cutting brown and weak (a great fault in the make this season), though the cheese that were true showed good quality.

In the Stilton Cheese Fair (36 cheese per entry), the exhibits were well below the usual standard of finest Stiltons, and the Judge was surprised at the large number of faulty and brown cheese. He did not consider there was sufficient merit in this class to recommend a third prize.

The other varieties of British-made cheese were fairly represented.

The feature of the exhibition of the bacon and hams that specially struck the Judge was the general mediocrity of the exhibits, there being only two or three that stood prominently for quality. Several sour, ill-flavoured hams were present, and some of the sides of bacon had slimed to such an extent that the slime had penetrated the skin of the gammons.

Butter and Cream entries numbered 593 and 35 respectively. Fresh and lightly-salted butters were present in their usual force from the best-known British dairies, while nearly all the "cured" butter came from Irish creameries, except the exhibits contained in special classes devoted to butter from the Colonies. In deference to the wish of Colonial exhibitors, their entries were judged according to the following scale of points:—

COLONIAL SALT BUTTER.		COLONIAL FRESH BUTTER.	
	Points.		Points.
Flavour	55	Flavour	60
(Should be sweet, mild, and nutty)		(Should be sweet, mild, and nutty)	
Texture	20	Texture	25
(Should be firm, granular)		(Should be firm, granular)	
Colour	10	Colour	10
(Should be clean straw-colour throughout)		(Should be clean straw-colour throughout)	
Salting	10	Packing	5
(Should be sufficiently salted without destroying the natural flavour peculiar to butter)			
Packing	5		
Total	100	Total	100

Many of the butter classes were very largely filled, and as a number of the exhibits were of practically equal merit, as in Class 58, it was very difficult to decide on the best specimens. The ornamental butter, with and without foliage or other extraneous decoration, showed much skill in manipulation.

The class for clotted cream was excellent throughout, but that for raw cream showed greater variation in quality and consistency.

The entries in the honey classes were far below the number of recent years, due, no doubt, to the adverse weather conditions prevailing during the honey-gathering season. Nor was the quality of the majority of the honey staged up to that high standard usually found. Taking the classes in detail, No. 76 (for light extracted honey) was perhaps the best, with 11 entries, containing as it did some fine samples of high-class honey. Class No. 77 (for medium-coloured honey) also contained some good samples. The two classes for heather honey were very badly filled, only containing a total of three entries, in spite of special advantages held out to producers of this fine honey. Some fine wax was shown. Class 83, for a display of comb and extracted honey, only brought three entries. Two of these were excellent, but the third contained some "honey" that had been gathered from a very doubtful source.

The Root Section was better than usual, many of the mangolds weighing up to 27 lbs. each. However, there were some very

well, not being so sound as smaller specimens. The first-prize collection of roots was a very fine one.

Butter-making competitions were in full swing throughout the four days of the Show. It may be well to refer to some of the defects noted by the Judges, viz.: (1) failure to ascertain the temperature of the air at the commencement of churning; (2) neglect to take the temperature of the cream at the breaking stage; and (3) spoiling the granular condition of the butter by overworking. The last fault often arose from anxiety to get the butter thoroughly dry.

Throughout the Milkers' Contests, both as regards males and females, there was a marked attention to cleanliness. In several cases the stripping was not clean. Taken as a whole the work was well done.

The most important class in the section for appliances was the one confined to milk strainers, or strainers and filters combined. The British Dairy Farmers' Association decided this year to offer a Gold Medal for such appliances, capable of effectually dealing, other than by centrifugal force, with at least 100 gallons of milk per hour. Ten straining appliances were entered for competition; and each strainer was tested separately during three days of the Show with 100 gallons of milk each, to which had been added peat-moss dust, fine sand, etc. After a preliminary trial, four of the best strainers were submitted to a further test with milk at different temperatures, and containing varying amounts of extraneous matter. Samples of milk which had been strained were kept in clean glass bottles in a cold chamber, and after standing 24 hours were examined carefully for visible sediment. Two other tests were also used in the final trials—a percentage dirt tester, kindly lent by Messrs. Burmeister and Wain, and an apparatus designed by Dr. Barwin, Medical Officer of Health for Derbyshire, for estimating closely the amount of sediment in any given sample of milk.

As the trials proceeded it soon became evident that a number of the strainers competing were quite unable to deal with the quantity of milk stated. The filtering surface in some instances was too small, and in consequence the strainers became clotted when only a small quantity of the milk had been dealt with. In other cases the construction of the strainers was faulty. Either the straining materials were placed in a wrong position or the milk was allowed to fall directly on to the straining cloths, forcing the dirt and sand through into the receiving vessel below. In all instances except one, the straining media consisted of a combination of a specially manufactured cotton cloth with wire gauze.

After careful testing and consideration by the Judges, the Gold Medal was awarded to Exhibit 1755, Pocock's Patent Standard Milk Clarifier, shown by the Dairy Outfit Company. This strainer is constructed on sound lines, and deals with the milk quickly and effectively. It has a large filtering surface, so arranged that

clotting is entirely prevented. The inside pan has a wire gauze at bottom, so placed that immediately the milk is poured in it is distributed gently over the whole surface of the filtering medium below. This medium is supported on bars of tinned wire in such a manner that a large number of separate filters are formed, thereby greatly increasing the capacity. This strainer can also be used in connection with the milk-pan of farm milk-refrigerators, and in this form should prove a very useful utensil, as the milk being warm and filtered before passing on to the cooler, the straining is quick and thorough, and all sediment being removed immediately, no material damage is done to the milk. The price of this strainer is high, but it was undoubtedly the best exhibited.

A Silver Medal was awarded to No. 1761, exhibited by Messrs. Burmeister & Wain. This strainer is simpler in construction and cheaper than No. 1755, but not so efficient. Here also the straining materials consist of wire gauze and cotton cloth, and the utensil is so constructed that it can be placed on the top of any railway churn or across a milk-receiving vessel.

A Bronze Medal was awarded to No. 1762, which is manufactured by Mr. T. Grayson, Queen Street, Derby. This was the only strainer shown that was made entirely of metal. The construction of this strainer is very ingenious, and, though small in size, it easily deals with the milk in the time stipulated. The strainer has a dome-shaped regulator that fits over the gauze. This arrangement prevents the milk being thrown directly on to the wire gauze, which, if permitted, would force the sediment through the mesh. It also takes away any pressure from the bowl when full of milk. The finest wire gauze is placed in such a position that the milk must rise before it finally leaves the strainer, and the sediment settles to a large extent in the recess provided by the inverted bottom. This is a very useful strainer for farm use. The utensil is easily kept clean, and there is no danger of milk contamination by using foul cloths.

In Class 93 (any other New Invention relating to the Dairy Industry) there were a large number of entries—twenty-three in all, and some of these were of considerable merit. The Dairy Supply Company were awarded a Silver Medal for exhibit No. 1764. This was Dr. N. Gerber's "Sal" Butyrometer, a modification of the well-known Gerber milk-tester. In the "Sal" method of milk testing, the necessity for the use of sulphuric acid is discarded, and in its place a special chemical preparation is used which is entirely free from any acid reaction; further, it possesses none of the corrosive properties of sulphuric acid, and yet is equally effective in operation. Tests were made during the Show with this improved milk-tester in conjunction with the ordinary Gerber test and chemical analysis, and the results in each case were almost identical. The use of sulphuric acid has always been a source of danger even with careful operators, and a safe and accurate method such as this one undoubtedly is will be welcomed.

The same Company also secured a Bronze Medal for their "Swiftsure" bottle-filling machine, which automatically receives bottles, fills and delivers them as fast as they can be removed by one man. It takes bottles of various sizes, and will be a useful implement for dairies having a large sale for milk in bottles.

Mr. H. Bartram, of Denman Street, London Bridge, was awarded a Bronze Medal for an improvement in the "L. K. G." milking machine. By the adoption of a pulsating motion the makers claim to have solved the difficulty of interference with the circulation of the blood, and that now the action of the machine when in use closely resembles the action of the calf's mouth when sucking.

The Mono-Service Vessels, Ltd., had an exhibit of Taylor's Hygienic "Milkups" and "Creamugs." To this entry a Bronze Medal was awarded. These are vessels, as the name implies, to be used once only. For certain branches of the dairy trade they will certainly be found very useful, especially where there is difficulty in getting cream jars returned.

Messrs. Robert Boby, Ltd., of Bury St. Edmund's, took a Silver Medal for the Garbutt "Two-minute" Churn. This churn was submitted to careful tests by the Judges during the Show, and the butter and buttermilk from one churning was submitted to Mr. Lloyd for analysis. The percentage of fat left in the buttermilk was very low, and on analysis the composition of the butter produced was satisfactory, the moisture found in the butter being about 13 per cent., which is well within the maximum allowed under the Butter Act of 1907. This churn produces butter from cream by *concussion*, and in this respect it differs from many quick-acting churns which produce butter by *friction*, thereby incorporating an excessive quantity of water in the butter.

Messrs. Burmeister & Wain exhibited their new "Perfect" Hand Separator, and were awarded a Silver Medal for this machine. This is certainly something new, and worthy the attention of dairymen. The machine was tested in the presence of the Judges with cold milk, and the skimming was perfect. Being constructed on the principle of a spinning top, it is self-balancing to a remarkable degree. The separator is almost noiseless, and the consumption of power is very small.

Bronze Medals were also awarded to Blackstone & Co., of Stamford, for an improved Swath Turner and Collector; to Mr. Hopkins, of Cheltenham, for a new Churn Lid Fastener; and to Mr. George Blackburn, of Liscard, Cheshire, for a Bottle-filling Machine. All these three inventions possessed considerable merit. The churn lid, exhibited by Mr. Hopkins, is certainly a useful invention. The action of opening and closing the lid is rapid, and the balanced "Cams" absolutely insures an even pressure all round the lid. A churn fitted with this lid was filled with hot water, and was found to be perfectly water-tight. Mr. Blackburn's bottle-

It is simple in construction

and easily kept clean. All parts are readily accessible, and can be taken apart for cleansing purposes in a short time. The milk is measured and bottled at one operation, and with wide-necked bottles the action is rapid and perfect.

Of the other exhibits in this class some certainly possessed no new or valuable features, while others were capable of improvement. Burmeister & Wain, however, had a milk churn fitted with a patent device to prevent rusting, and this churn certainly warrants an extended trial. The can is made in one piece, and the lid is almost perfectly air-tight.

THE MILKING TRIALS OF 1907.

BY WILLIAM ASHCROFT, The Waldrons, Croydon.

The Milking Trials this year were carried out on similar lines to previous years, with the exception of some alteration and improvement in practical details and one minor point to be noted later on.

The data on which the awards were calculated, are as follows, viz. :—

- (1) One point for every pound of milk, taking the average of two days' yield.
- (2) Twenty points for every pound of butter-fat produced, calculated from analysis.
- (3) Four points for every pound of solids other than fat, similarly calculated.
- (4) One point for every 10 days since calving, after the first 40 days, with a maximum allowance of 12.

It will be seen that the maximum allowance for points since calving was reduced from 14 to 12.

The deductions made were 10 each time the milk fell below 3 per cent. of fat, or below 8·5 per cent. of solids other than fat.

The standard of points below which no prize was to be awarded remained the same as last year, viz. :—

Cows.						Points.
Shorthorns, Pedigree	..	..	..	..	..	85
Do. Non-Pedigree	..	..	..	..	..	110
Jerseys	..	..	..	..	..	95
Guernseys	..	..	..	..	..	85
Red Polls	..	..	..	..	..	90
Ayrshires	..	..	..	..	..	90
Kerries	..	..	..	..	..	75
Dexters	..	..	..	..	..	75
South Devons	..	..	..	..	..	100

There was no standard in the case of heifers.

The cows were stripped on Tuesday evening, and the morning's and evening's milk of Wednesday and Thursday weighed and averaged. The milk for analysis was taken on Wednesday, both morning and evening. The milking commenced at 6-30 a.m. and 6-0 p.m. A considerable improvement in the management of these trials was effected this year by having the weighing carried out in

the central alley (the public being necessarily excluded from that and the side alleys *pro tem*). To do this some alteration had to be made in the arrangement of the cows, but this alteration was no disadvantage in any way, and a great aid to thorough supervision.

Pails with each cow's number attached were also provided by the Association, and a stringent bye-law enforced that to milk into any other would warrant disqualification.

Tables giving full details of the milk of every cow competing will, as usual, be found at the end of the report, and I extend here the four tables in which the writer of the report for 1906 summarised the chief points of interest.

It will, I think, be more convenient for the general reader and exhibitor if what comments I make on these be made *breed by breed*.

TABLE II.—NUMBER OF COWS (NOT INCLUDING HEIFERS)
YIELDING MILK DEFICIENT IN FAT OR SOLIDS OTHER
THAN FAT.

BREED	Less than 3 per cent. of Fat		Less than 8·5 per cent. of Solids not Fat			
	1890-1905	1906	1907	1902-1905	1906	1907
Shorthorns, Pedigree ...	4*	4	8	3	1	2
Do. Non-Pedigree	11*	4	8	9	3	0
Lincoln Red Shorthorns...	0	0	3	0	0	0
Jerseys	6	0	0	2	0	0
Guernseys	2	0	0	1	0	0
Red Polls	25	3	1	5	0	0
Ayrshires	0	1	2	0	0	1
Kerries	8	0	0	0	0	0
Dexters	0	1	0	0	0	1
Crosses	27	5	0	9	0	0
South Devons	0	1	0	0	0	0

* Three years only, 1903-05. The total for both classes for 16 years was 84.

TABLE III.—QUANTITY AND QUALITY OF MILK.

Breed	Period	Number of Cows	Weight of Milk	COMPOSITION OF MILK		
				Fat	Solids other than Fat	Total Solids
Shorthorns, Pedigree and Non-Pedigree..}	In 5 Years 1900-1904	123	48.8	3.72	8.89	12.61
Shorthorns, Pedigree...	1905	8	43.3	3.40	9.07	12.47
" " ...	1906	11	46.7	3.36	8.93	12.29
" " ...	1907	17	47.9	3.56	8.95	12.51
Shorthorns, Non-Pedigree }	1905	14	50.8	4.12	8.97	13.09
" " }	1906	15	47.3	3.58	8.77	12.35
" " }	1907	22	50.8	3.54	8.92	12.46
Lincolnshire Red Shorthorns }	1907	7	51.8	3.41	8.95	12.36
Jerseys	1900-1904	111	31.3	5.20	9.20	14.40
"	1905	13	34.7	5.25	9.14	14.39
"	1906	13	33.1	4.75	9.33	14.08
"	1907	12	34.9	5.10	9.17	14.27
Guernseys	1900-1904	36	31.5	4.58	9.07	13.65
"	1905	5	31.4	4.81	9.15	13.96
"	1906	6	34.5	4.42	9.29	13.71
"	1907	5	35.7	4.59	9.34	13.93
Red Polls	1900-1904	33	40.5	3.70	9.00	12.70
"	1905	13	38.5	3.63	8.93	12.56
"	1906	11	37.4	3.35	9.02	12.37
"	1907	8	41.5	3.62	8.87	12.49
Ayrshires	1906	3	42.5	3.56	9.02	12.58
"	1907	3	33.5	3.22	8.85	12.07
South Devons	1906	5	48.3	3.72	9.21	12.93
Kerries	1900-1904	43	30.9	4.12	9.14	13.26
"	1905	8	28.2	4.10	8.96	13.06
"	1906	5	36.0	4.25	9.22	13.47
"	1907	5	40.3	4.3	8.98	13.28
Dexters	1906	3	24.4	3.38	8.90	12.28
"	1907	8	31.0	3.66	9.06	12.72
Crosses	1900-1904	50	45.1	3.92	8.94	12.86
"	1905	12	45.7	3.82	9.08	12.90
"	1906	13	46.4	3.54	9.14	12.68

TABLE IV.—QUANTITY AND QUALITY OF MILK, 1906 AND 1907.

BREED	Year	No. of Cows	Average Weight of Milk		Percentage Composition of Milk							
			Morn.	Even.	Fat		Solids not Fat		Total Solids			
					Morn.	Even.	Morn.	Even.	Morn.	Even.		
Shorthorns, Pedigree	1906	11	23.9	22.8	3.26	3.46	8.91	8.95	12.17	12.41		
	1907	17	24.2	23.7	3.14	3.08	9.02	8.88	12.16	12.86		
Do. do. (Heifers)	1906	3	14.8	13.9	3.64	4.10	9.46	9.11	13.10	13.21		
	1907	7	11.7	11.4	3.7	3.60	9.16	9.37	12.86	12.97		
Shorthorns, Non-Pedigree ..	1906	15	23.7	23.6	3.34	3.82	8.83	8.72	12.17	12.54		
	1907	22	25.8	25.0	3.37	3.72	8.95	8.9	12.32	12.62		
Do. do. (Heifers)	1906	7	16.0	15.3	3.41	3.95	9.10	9.05	12.51	13.00		
	1907	8	18.8	17.7	3.28	3.54	9.24	9.24	12.52	12.78		
Lincolnshire Red Shorthorns	1906	7	27.1	24.7	3.28	3.55	8.95	8.95	12.23	12.50		
	1907	13	17.1	16.0	4.69	4.81	9.34	9.32	14.03	14.13		
Jerseys	1906	12	18.0	16.9	4.51	5.68	9.25	9.09	13.76	14.77		
	1907	6	17.9	16.6	4.33	4.51	9.31	9.26	13.64	13.77		
Guernseys	1906	5	17.4	18.3	4.58	4.60	9.39	9.30	13.97	13.90		
	1907	11	18.9	18.5	3.10	3.60	9.15	8.89	12.25	12.49		
Red Polls	1906	8	21.9	19.6	3.58	3.67	8.84	8.91	12.42	12.58		
	1907	9	14.5	14.2	2.79	3.22	9.32	9.22	12.11	12.44		
Do. (Heifers)	1906	8	14.26	13.35	3.76	3.52	9.14	9.07	12.90	12.59		
	1907	3	22.2	20.3	3.57	3.56	9.01	9.03	12.58	12.59		
Ayrshires	1906	3	16.9	16.6	3.16	3.62	8.89	8.81	12.05	12.43		
	1907	5	25.1	23.2	3.44	4.01	9.27	9.15	12.71	13.16		
South Devons	1906	5	18.8	17.7	4.17	4.34	9.20	9.23	13.37	13.57		
	1907	5	20.5	19.8	3.88	4.73	9.07	8.89	12.95	13.62		
Kerries	1906	3	12.3	12.1	3.29	3.45	9.16	8.65	12.45	12.10		
	1907	8	16.1	14.9	3.69	3.63	9.08	9.05	12.77	12.68		
Dexters	1906	13	23.5	22.9	3.39	3.69	9.19	9.10	12.58	12.79		
	1907	6	14.8	14.7	3.18	3.93	9.20	9.08	12.38	13.01		
Do. (Heifers)	1906	6	14.8	14.7	3.18	3.93	9.20	9.08	12.38	13.01		

Taking first, therefore, Class 1, for Pedigree Shorthorns, we find considerable improvement. The numbers of cows that have gained points above the standard are 12 out of 17. This is a goodly percentage higher than has ever been gained by the Pedigree Shorthorns (being about 70 per cent.), and it raises the average for this class for the past 5 years to 51 per cent.

It should be noticed, however, that 8 cows out of 17 (very nearly half) have had deductions made from their points for the milk falling below 3 per cent. of butter-fat—in fact the milks of the first prize cow and 4 others that gained points above the standard fell below 3 per cent. in the morning's milking.

The average percentage of fat found in the milk was, however, higher than the last two years.

Class 2 (Non-Pedigree Shorthorns), numbering 22, does not comparatively come out quite so well, as only 8 out of the 22 gained points above the standard, which is 110 for this class, whereas in 1903, 1904, and 1905, when the standard was higher (*viz.*, 120), 10 out of 16, 6 out of 14, and 5 out of 16 were above the required number of points for distinction.

The average composition of the milk, both in fat and solids other than fat, is about the same as last year, and not so good as in 1905.

The first and second prize cows were, however, more than up to the usual standard. The first prize (No. 37) gave 6 gallons of milk containing in the morning 5.84 per cent. of fat and in the evening 6.90. She made slightly over 4 lbs. of butter from the day's milking, and ought to be written down a "marvel." She had calved 6 weeks. It seems to the writer that it would be a step in the right direction if the British Dairy Farmers' Association, who attach great importance to their milking trials, could see their way to making them of more value by arranging to have cows with such records as the above, or approaching thereto, tested again—say when they have been 6 months calved. It would not be a very expensive matter to have the mornings' and evenings' milk of cows like the above taken even twice, proper witnesses being appointed say when they have calved 4 months and 8 months, and the public would then be in a far better position to assess the quantity given at the Dairy Show at its proper value. Surely any breeder or exhibitor would be pleased to have such tests made. In this class, 8 cows out of 22 had points deducted for their milk falling below 3 per cent. of fat, and 3 out of those 8 were deficient both morning and evening.

Class 3.—Lincolnshire Red Shorthorns had a class to themselves this year for the first time: formerly they were exhibited with the Non-Pedigree Shorthorns. Three out of the seven had deductions made for milk below the standard (though not much below), nevertheless the average number of points gained by the seven was 103.6,

Shorthorns, which was 102·4, or 94·5 average points gained by the 17 Pedigree Shorthorns.

Class 6.—The percentage of fat in the Jerseys last year was, like that in most of the other breeds, below what has been usually found; this year it has improved again, though still slightly below the analysis of 1900–05, but the Jerseys the last two years have not furnished such heavy milkers as previously. In 1906 and 1907, 25 animals altogether competed, of which only 6 (or about 24 per cent.) obtained points above the standard; whereas in 1903, 1904, and 1905, 45 animals competed, out of which 20 (or 45 per cent.) were above the standard; the average number of points gained by the 12 was 86·9.

Class 9 (Guernseys), 5 in number, were on the other hand rather better than we have seen of late; 3 out of the 5 gained points above the standard, and the average number of points gained was 84·6.

Class 11 (Red Polls).—This class furnishes an instance of how difficult it is to generalise. In Classes 1 and 2 it was pointed out how rather more animals than usual had had deductions made for a small percentage of fat, whereas in Class II. eight cows competing, only one fell below the standard, and that in a class where deductions have generally to be made. The average percentage of fat was better than last year, and about equal to previous years; the average number of points gained was 90·5, which is just above the standard for the breed, four cows being above the standard.

Class 13 (Ayrshires) really need no comment. The three animals competing can in no ways be considered as at all representing the milking qualities of the breed. One had been in milk over a year, and gave three quarts of milk; another suffered four deductions, her milk morning and evening being below 3 per cent. of fat and 8·5 of solids; and the third cow's milk had only 2·53 per cent. of fat in it in the morning. Is it any wonder no award was made?

Class 15 (Kerries).—In contradistinction to the Ayrshires, the five Kerries that were shown were perhaps for their weight as good milkers as any in the Show. The standard for Kerries is 75, and, except one, they were all above it, and the one that failed to do so only missed by a decimal point—74·9 instead of 75. The average points scored by the five was 91·3, a higher average than the Red Polls, Jerseys, or Guernseys, and very little less than the Pedigree Shorthorns. The fat in the milk averaged 4·3, slightly above the average of the last seven years, and would total 1·73 lbs. butter-fat per cow—nearly equal to the Jerseys, which would be 1·76; and above the Guernseys, which works out to 1·63; above the Pedigree Shorthorns, which would average 1·70; and a long way above the Red Polls.

Class 16 (Dexters) were entirely outpaced by the sister breed, both in quantity and quality of milk. Only two out of eight

70·5, as against 91·3 gained by the Kerries. The fat in the milk averaged 3·66, as against 4·3 in the Kerries.

There were no entries of South Devons, and no class was provided for Cross-bred Cows.

It remains to say a few words about the Heifers, who are included in Table IV.

The milk of the Pedigree Heifers was less in quantity and poorer in the evening in quality than last year, but as only three Heifers were competing last year it is as well not to make comparisons, as too much in such a small number may depend on the milk of one Heifer in striking an average. There were two deductions for deficiency in fat, and one for solids other than fat, in this class.

The Non-Pedigree Shorthorns, as compared with last year, gave rather more milk with not so much butter-fat, and rather higher solids other than fat, and their numbers were about the same—seven and eight. There were three deductions for deficiency in fat.

The Red Polls.—The Heifers, like the Red Poll cows, gave milk decidedly richer in butter-fat than last year. The number of Heifers competing was about the same—eight this year and nine last—and the quantity of milk given did not vary practically. There were two deductions for deficiencies in fat, and one for solids other than fat.

CLASS I.—PEDIGREE SHORTHORN COWS.

Number Name ..	..	..	..	2 Every Countess 3rd	3 Candy Maud	4 Waterloo Rose 10th	5 Fearless
Age ..	..	..	..	7 yr. 6 m. 3 w. 6	7 yr. 4 m. 3	5 yr. 4 m. 2½ w. July 4, 96	7 yr. 3 w. Aug. 25, 94
Number of Calves ..	..	..	..	Sept. 1, 37	Sept. 11, 27		
Last Calved ..	..	..	..	
Days since Calving ..	..	..	..	
Weight of Milk, 1st day ..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	..	..	..	15.3 13.6	28.4 26.3	18.0 20.4	24.5 21.7
Total ..	..	..	..	15.5 14.6	28.5 28.3	22.2 21.4	24.3 21.7
Average ..	..	..	..	30.8 28.2	56.9 54.6	40.2 41.8	48.8 43.4
Percentage { Fat ..	..	..	..	15.4 14.1	28.4 27.3	20.1 20.9	24.4 21.7
Composition of { Solids other than Fat ..	..	..	..	2.67 3.45	3.61 3.99	3.19 4.03	3.62 3.70
the Milk. { Solids ..	..	..	..	9.17 8.91	9.61 9.09	8.51 8.35	9.14 9.12
Actual weight of Fat, in lbs. ..	..	..	..	11.84 12.36	13.22 13.08	11.70 12.38	12.76 12.82
Calculation of Points multiply by 20 ..	..	..	..	.41 .48	1.03 1.09	.64 .84	.88 .8
Actual weight of Solids other than Fat, in lbs ..	..	..	..	8.2 9.6	20.5 21.8	12.8 16.8	17.6 16.0
Calculation of Points multiply by 4 ..	..	..	..	1.41 1.25	2.71 2.48	1.71 1.75	2.21 1.98
Points { For time since Calving ..	..	..	..	5.6 5.00	10.8 9.9	6.8 7.0	8.8 7.9
{ For weight of Milk ..	..	..	..	
{ For weight of Fat ..	..	..	..	29.5	55.7	5.6	44
{ For weight of Solids other than Fat ..	..	..	..	17.8	42.4	41.0	46.1
Total ..	..	..	..	10.6	20.7	29.6	33.6
Deductions ..	..	..	..	57.9	118.8	13.8	16.7
Points gained ..	..	..	..	10.0	90.0	90.0	96.5
Remarks and Awards ..	..	..	..	47.9	118.8	10.0	96.8
	..	..	..			80.0	
	..	..	..				Highly Commended.

2nd Prize, equal with 91,
Exhibit with No. 1, for
Shorthorn Society's Prize.

CLASS 1.—PEDIGREE SHORTHORN COWS—Continued.

Number Name ..	..	..	..	6 Blossom 5th	7 Tulip 7th	8 Fair Promise	9 Heather Queen
Age ..	..	..	..	12 yr. 3 w.	5 yr. 2 w.	10 yr. 5 m. 2 w.	6 yr.
Number of Calves ..	..	..	..	8	2	Aug. 28.	3
Last Calved ..	..	..	..	Sept. 16.	Sept. 16.	41	Sept. 15.
Days since Calving ..	..	..	..	22	22		23
Weight of Milk, 1st day ..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	..	..	..	30.8 28.0	20.1 18.9	26.0 23.4	23.7 23.5
Total ..	..	..	..	27.5 21.4	20.8 17.7	27.1 23.2	11.6 23.7
Average ..	..	..	..	58.3 49.4	40.9 36.6	53.1 46.6	35.3 49.2
	..	..	..	29.1 24.7	20.4 18.3	26.5 23.3	17.6 24.6
Percentage of { Fat ..	..	..	..	3.32 4.15	3.94 4.81	2.96 3.81	3.29 5.83
Composition of { Solids other than Fat ..	..	..	..	9.18 9.35	9.30 9.07	8.68 8.61	8.47 8.15
the Milk. { Solids ..	..	..	..	12.50 13.50	13.24 13.88	11.64 12.42	11.76 13.98
Actual weight of Fat, in lbs. ..	..	..	..	.96 1.03	.80 .88	.78 .88	.58 1.41
Calculation of Points multiply by 20 ..	..	..	..	19.2 20.6	16.0 17.6	15.6 17.6	11.6 28.8
Actual weight of Solids other than Fat, in lbs. ..	..	..	..	2.68 2.31	1.90 1.66	2.3 2.0	1.48 2.01
Calculation of Points multiply by 4 ..	..	..	..	10.7 9.2	7.6 6.6	9.2 8.0	5.92 8.04
{ For time since Calving ..	..	..	..	—	—	.1	—
{ For weight of Milk ..	..	..	..	53.8	38.7	49.8	42.2
{ For weight of Fat ..	..	..	..	39.8	33.6	33.2	40.4
{ For weight of Solids other than Fat ..	..	..	..	19.9	14.2	17.2	13.9
Total ..	..	..	..	113.5	86.5	100.3	96.5
Deductions ..	..	..	..	—	—	10.0	20.0
Points gained ..	..	..	..	113.5	86.5	90.3	76.5
Remarks and Awards ..	..	..	..	Reserve.		Commended.	

CLASS 1.—PEDIGREE SHORTHORN COWS—Continued.

Number Name ..	..	..	..	12 Red Rose 3rd 6 yr. 10 m. 1½ w. 4 Aug. 5. 64	13 Broadhooks, 3rd 9 yr. 6 m. 1 w. 7 Aug. 17. 52	14 Dorothy 6 yr. 4 m. 1 w. 4 April 3. 188	15 Melody 12 yr. 1 m. 3 w. — Aug. 31. 38
Age ..	..	..	..	..	..	..	..
Number of Calves ..	..	..	..	..	..	..	..
Last Calved ..	..	..	..	..	..	..	..
Days since Calving ..	..	..	..	..	..	..	..
Weight of Milk, 1st day ..	..	..	..	Morn. Even. 33.4 30.0	Morn. Even. 22.7 22.9	Morn. Even. 20.8 16.8	Morn. Even. 34.0 36.4
Weight of Milk, 2nd day ..	..	..	..	29.8 27.9	21.0 23.2	20.5 17.0	34.3 33.0
Total ..	..	..	..	63.2 57.9	43.7 46.1	41.3 33.8	68.3 69.4
Average ..	..	..	..	31.6 28.9	21.8 23.0	20.6 16.9	34.1 34.7
Percentage Composition of the Milk. { Fat Solids other than Fat ..	..	..	..	2.92 3.52 8.80 8.84	3.16 4.95 9.02 8.73	3.85 3.42 8.93 9.10	2.82 3.33 9.26 8.93
Actual weight of Fat, in lbs. ..	..	..	..	11.72 12.36	12.18 13.68	12.78 12.52	12.08 12.26
Calculation of Points multiply by 20 ..	..	..	..	.93 .97	.69 1.14	.79 .58	.96 1.16
Actual weight of Solids other than Fat, in lbs ..	..	..	..	18.6 19.4	13.8 22.8	15.8 11.6	19.2 23.2
Calculation of Points multiply by 4 ..	..	..	..	2.80 2.44 11.20 9.8	1.96 2.0 7.84 8.0	1.84 1.55 7.36 6.20	3.15 3.10 12.60 12.40
Points { For time since Calving ..	..	..	..	2.4	1.2	12.0	—
For weight of Milk ..	..	..	..	60.5	44.8	37.5	68.8
For weight of Fat ..	..	..	..	38.0	36.6	27.4	42.4
For weight of Solids other than Fat ..	..	..	..	21.0	15.8	13.6	25.0
Total ..	..	..	..	121.9	98.4	90.5	136.2
Deductions ..	..	..	..	10.0	—	—	10.0
Points gained ..	..	..	..	111.9	98.4	90.5	126.2
Remarks and Awards ..	..	..	..	Very Highly Commended.	Highly Commended.	Commended.	1st Prize. Equal with No. 3 for Shorthorn Society's Prize.

CLASS 1.—PEDIGREE SHORTHORN COWS—Continued.

Number Name ..	16 Barrington Crun	17 Darlington Crauford 11th	19 Sweet Duchess 2nd	20 Ewbery Beauty
Age ..	6 yr. 1 m. 2 w.	5 yr. 4 m.	5 yr. 3 m. 4 w.	6 yr. 11 m. 1 w. 6 d.
Number of Calves ..	—	3	3	—
Last Calved ..	Aug. 25.	July 14.	Sept. 12.	July 6.
Days since Calving ..	44	86	26	94
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	16.0 30.0	24.5 26.4	28.0 24.9	21.0 19.0
Total ..	20.4 23.8	26.0 24.2	27.5 26.7	23.0 20.2
Average ..	36.4 53.8	50.5 50.6	55.5 51.6	44.0 39.2
Percentage { Fat ..	18.2 26.9	25.2 25.3	27.7 25.8	22.0 19.6
Composition of { Solids other than Fat ..	1.87 4.71	2.87 3.60	2.87 3.36	3.14 2.66
the Milk. { Solids ..	9.31 8.93	9.27 9.24	8.93 8.78	8.54 8.52
Actual weight of Fat, in lbs. ..	11.18 13.64	12.14 12.84	11.80 12.14	11.68 11.18
Calculation of Points multiply by 20 ..	.34 1.27	.72 .91	.79 .87	.69 .52
Actual weight of Solids other than Fat, in lbs ..	6.8 25.4	14.4 18.2	15.8 17.4	13.8 10.4
Calculation of Points multiply by 4 ..	1.68 2.38	2.34 2.34	2.48 2.26	1.90 1.67
Points { For time since Calving ..	6.72 9.52	9.36 9.36	9.92 9.04	7.60 6.68
{ For weight of Milk ..	4.6	4.6	53.5	5.4
{ For weight of Fat ..	45.1	50.5	33.2	41.6
{ For weight of Solids other than Fat ..	32.2	32.6	18.9	24.2
Total ..	16.2	18.8	18.9	14.3
Deductions ..	93.9	106.5	105.6	85.5
Points gained ..	10.0	10.0	10.0	10.0
Remarks and Awards ..	83.9	96.5	95.6	75.5
	Highly Commended.	Highly Commended.	Highly Commended.	

CLASS 1.—PEDIGREE SHORTHORN COWS—Continued.

Number	..	..	..	..	21
Name ..	..	..	..	..	Red Millicent III.
Age ..	..	..	..	..	4y. 7m. 1w. 6d.
Number of Calves	..	..	..	..	3
Last Calved ..	..	..	..	..	Aug. 11.
Days since Calving	..	..	..	..	58
Weight of Milk, 1st day	..	..	..	..	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	26.9 26.3
Total	..	..	..	..	29.0 28.1
Average ..	..	..	..	..	55.9 54.4
Percentage	..	..	..	..	27.9 27.2
Composition of	..	..	..	..	3.24 4.20
the Milk.	..	..	..	..	9.26 9.19
Actual weight of Fat, in lbs.	..	..	..	..	12.50 13.48
Calculation of Points multiply by 20	..	..	..	..	.90 1.17
Actual weight of Solids other than Fat, in lbs	..	..	..	..	18.0 23.4
Calculation of Points multiply by 4	..	..	..	..	2.6 2.5
Points	..	..	..	..	10.4 10.0
For time since Calving	..	..	..	..	1.8
For weight of Milk	..	..	..	..	55.1
For weight of Fat	..	..	..	..	41.4
For weight of Solids other than Fat	..	..	..	..	20.4
Total ..	..	..	..	..	118.7
Deductions ..	..	..	..	..	—
Points gained	..	..	..	..	118.7
Remarks and Awards	..	..	..	..	Equal 2nd Prize with No. 3.

CLASS 2.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1).

Number	..	..	..	..	24 Martha	25 Margaret	27 Perfection	28 Limesdale Lady
Age ..	..	..	..	..	7 yr.	6 yr.	7 yr.	5 yr. 5 m.
Number of Calves ..	..	..	..	..	—	—	—	—
Last Calved ..	..	..	..	..	May 3.	Aug. 9.	Sept. 21.	Aug. 14.
Days since Calving ..	..	..	..	..	158	60	17	55
Weight of Milk, 1st day	..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	21.6 19.6	31.7 30.0	35.8 32.0	21.0 20.4
Total ..	..	..	..	..	23.5 22.8	31.0 28.6	36.3 33.8	23.8 18.8
Average ..	..	..	..	..	45.0 42.4	62.7 58.6	72.1 65.8	44.8 39.2
Percentage	..	..	..	..	22.5 21.2	31.3 29.3	36.0 32.9	22.4 19.6
Composition of	..	..	..	..	2.95 2.63	2.47 3.74	4.32 3.45	3.39 3.93
the Milk.	..	..	..	..	9.01 9.11	8.91 8.76	9.38 9.55	8.57 8.57
Actual weight of Fat, in lbs.	..	..	..	..	11.96 11.74	11.38 12.50	13.70 13.00	11.96 12.50
Calculation of Points multiply by 20	..	..	..	..	.66 .56	.77 1.1	1.56 1.17	.76 .77
Actual weight of Solids other than Fat, in lbs.	..	..	..	..	13.2 11.2	15.4 22.0	31.2 23.4	15.2 15.4
Calculation of Points multiply by 4	..	..	..	..	2.03 1.94	2.8 2.44	3.4 3.15	1.92 1.67
Points	..	..	..	..	8.12 7.76	11.2 9.76	13.6 12.60	7.68 6.68
For time since Calving ..	..	..	..	..	11.8	2.0	—	1.5
For weight of Milk ..	..	..	..	..	43.7	60.6	68.9	42.0
For weight of Fat ..	..	..	..	..	24.4	37.4	54.6	30.6
For weight of Solids other than Fat	..	..	..	..	15.9	21.0	26.2	14.4
Total ..	..	..	..	..	95.8	121.0	149.7	88.5
Deductions ..	..	..	..	..	20.0	10.0	—	—
Points gained	..	..	..	..	75.8	111.0	149.7	88.5
Remarks and Awards	..	..	..	..	2nd Prize; Reserve Challenge Cup; for Best Cow and Best's Cup. for Lord Mayor's Cup.			

CLASS 2.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1)—Continued.

Number Name ..	29 Burnside Belle	31 White Heather	32 Lilly	33 Roso
Age ..	5 yr. 3 m.	Unknown.	5 yr. 9 m.	5 yr. 3 m.
Number of Calves ..	Aug. 30. 39	Sept. 14. 24	Sept. 14. 24	Sept. 15. 23
Last Calved ..				
Days since Calving ..				
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	21.7 19.7	19.0 20.1	21.1 21.5	14.3 15.7
Total ..	23.1 18.7	22.0 20.7	20.8 23.7	17.4 18.5
Average ..	44.8 38.4	41.0 40.8	41.9 45.2	31.7 34.2
Percentage	22.4 19.2	20.5 20.4	20.9 22.6	15.8 17.1
Composition of	3.24 2.83	3.30 3.66	3.68 4.15	3.83 4.20
the Milk. { Solids other than Fat ..	8.52 8.67	9.04 9.04	9.12 9.05	9.15 8.90
Actual weight of Fat, in lbs. ..	11.76 11.50	12.34 12.70	12.80 13.20	12.98 13.10
Calculation of Points multiply by 20 ..	.73 .54	.68 .72	.77 .94	.61 .72
Actual weight of Solids other than Fat, in lbs	14.6 10.8	13.6 14.4	15.4 18.8	12.2 14.4
Calculation of Points multiply by 4 ..	1.90 1.66	1.85 1.85	1.92 2.04	1.45 1.54
Points { For time since Calving ..	7.60 6.64	7.40 7.40	7.68 8.16	5.80 6.16
{ For weight of Milk ..	41.6	40.9	43.5	32.9
{ For weight of Fat ..	25.4	28.0	34.2	26.6
{ For weight of Solids other than Fat	14.2	14.8	15.9	12.0
Total ..	81.2	83.7	93.6	71.5
Deductions ..	10.0			
Points gained	71.2	83.7	93.6	71.5
Remarks and Awards ..				

CLASS 2.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1)—Continued.

Number	34 Daisy	36 Dot	37 Daisy	38 Sally
Name ..	6 yr. 3 115	7 yr. 4 42	6 yr. 3 34	
Age ..	June 15.	Aug. 27.	Sept. 4.	
Number of Calves ..	115	42	34	
Last Calved ..	—	—	—	
Days since Calving ..	71	—	—	
Weight of Milk, 1st day	Morn. Even.	Morn. Even.	Morn. Even.	
Weight of Milk, 2nd day	17.7 15.9	31.0 30.1	23.3 25.0	
Total	18.5 16.1	27.6 31.9	30.4 29.4	
Average ..	36.2 32.0	58.6 62.0	53.7 54.4	
Percentage { Fat	18.1 16.0	29.3 31.0	26.8 27.2	
Composition of { Solids other than Fat	3.77 3.82	5.84 6.90	3.10 3.18	
the Milk. { Solids ..	8.89 8.90	9.04 8.50	8.84 8.62	
Actual weight of Fat, in lbs.	12.66 12.72	14.88 15.40	11.94 11.80	
Calculation of Points multiply by 20	.68 .61	1.71 2.14	.83 .87	
Actual weight of Solids other than Fat, in lbs	13.6 12.2	34.2 42.8	16.6 17.4	
Calculation of Points multiply by 4	1.60 1.43	2.66 2.64	2.38 2.35	
Points { For time since Calving	6.40 5.72	10.64 10.56	9.52 9.40	
{ For weight of Milk	3.1	.2	—	
{ For weight of Fat	34.1	60.3	54.0	
{ For weight of Solids other than Fat	25.8	77.0	34.0	
Total ..	12.1	21.2	18.9	
Deductions ..	75.1	158.7	106.9	
Points gained	—	—	—	
Remarks and Awards	75.1	158.7	106.9	
		1st Prize	Barham Challenge Cup.	
		1st and 2nd Prize Cup.	Spencer Challenge Cup	

CLASS 2.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1)—Continued.

Number Name ..	..	..	..	..	40 Sweetheart	41 Coombe Star	46 Flo	47 Maud
Age ..	..	..	..	..	About 7 yr.	5 yr.	6 yr. 3 m.	6 yr.
Number of Calves ..	..	..	..	..	—	—	—	—
Last Calved ..	..	..	..	..	June 4, 126	July 14, 86	Aug. 31, 38	Sept. 11, 27
Days since Calving ..	..	..	..	..	..	..	..	..
Weight of Milk, 1st day	..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	34.4 32.0	25.9 22.5	16.5 20.7	24.3 27.0
Total ..	..	..	..	..	34.6 33.0	25.6 22.5	19.9 24.9	28.5 27.2
Average ..	..	..	..	..	69.0 65.0	51.5 45.0	36.4 45.6	52.8 54.2
Percentage	..	..	..	..	34.5 32.5	25.7 22.5	18.2 22.8	26.4 27.1
Composition of	..	..	..	..	2.95 3.57	2.66 2.94	3.15 3.37	3.07 3.48
the Milk.	..	..	..	..	8.95 8.87	8.62 8.88	8.99 8.69	9.11 8.98
Actual weight of Fat, in lbs.	..	..	..	..	11.90 12.44	11.28 11.82	12.14 12.06	12.18 12.46
Calculation of Points multiply by 20	..	..	..	..	1.02 1.17	.68 .66	.57 .77	.81 .94
Actual weight of Solids other than Fat, in lbs	..	..	..	..	20.4 23.4	13.6 13.2	11.4 15.4	16.2 18.8
Calculation of Points multiply by 4	..	..	..	..	3.08 2.9	2.22 2.0	1.63 1.98	2.42 2.42
Points	..	..	..	..	12.32 11.6	8.88 8.0	6.52 7.92	9.68 9.68
For time since Calving ..	..	..	..	..	8.6	4.6	—	—
For weight of Milk ..	..	..	..	..	67.0	48.2	41.0	53.5
For weight of Fat ..	..	..	..	..	43.8	26.8	26.8	35.0
For weight of Solids other than Fat	..	..	..	..	23.9	16.9	14.4	19.4
Total ..	..	..	..	..	143.3	96.3	82.2	107.9
Deductions ..	..	..	..	..	10.0	20.0	—	—
Points gained	..	..	..	..	133.3	76.5	82.2	107.9
Remarks and Awards	..	..	..	..	Disqualified.	..	..	..

CLASS 2.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1)—Continued.

Number Name ..	..	..	..	48 Polly 1st	49 Polly II.	30 Nancy	51 —
Age ..	..	..	..	9 yr. 4 m. 7 Aug. 9. 60	5 yr. 3 m. 4 w. 7 Aug. 9. 60	4 yr. 3 m. 3 Aug. 7. 62	5 yr. 4 m. — Sept. 6. 32
Number of Calves	..	..	..	Morn. Even. 25.5 25.1	Morn. Even. 25.8 25.0	Morn. Even. 25.1 26.9	Morn. Even. 35.4 31.2
Last Calved ..	..	..	..	28.7 28.1	26.3 27.7	29.6 27.5	36.6 32.4
Days since Calving ..	..	..	..	54.2 53.2	52.1 52.7	54.7 54.4	72.0 63.6
Weight of Milk, 1st day	..	..	..	27.1 26.6	26.0 26.3	27.3 27.2	36.0 31.8
Weight of Milk, 2nd day	..	..	..	3.19 4.09	2.59 3.72	2.14 2.65	4.10 3.94
Total	..	..	..	8.95 8.71	8.83 8.76	8.74 8.95	8.76 8.78
Average ..	..	..	..	12.14 12.80	11.42 12.48	10.88 11.60	12.86 12.72
Percentage { Fat	..	..	..	.86 1.09	.67 .98	.58 .72	1.47 1.25
Composition of { Solids other than Fat	..	..	..	17.2 21.8	13.4 19.6	11.6 14.4	29.4 25.0
the Milk. { Solids ..	..	..	..	2.40 2.32	2.30 2.3	2.25 2.42	3.16 2.8
Actual weight of Fat, in lbs.	..	..	..	9.60 9.28	9.20 9.2	9.00 9.68	12.64 11.2
Calculation of Points multiply by 20	..	..	..	2.0	2.0	2.2	—
Actual weight of Solids other than Fat, in lbs	..	..	..	53.7	52.3	54.5	67.8
Calculation of Points multiply by 4	..	..	..	39.0	33.0	26.0	54.4
Points { For time since Calving	..	..	..	18.9	18.4	18.7	23.8
{ For weight of Milk	..	..	..	113.6	105.7	101.4	146.0
{ For weight of Fat	..	..	..	—	10.0	20.0	—
{ For weight of Solids other than Fat	..	..	..	113.6	95.7	81.4	146.0
Total ..	..	..	..	Commended.			3rd Prize
Deductions ..	..	..	..				Reserve
Points gained	..	..	..				Spencer Challenge Cup
Remarks and Awards	..	..	..	

CLASS 2.—SHORTHORN COWS (NOT ELIGIBLE IN CLASS 1)—Continued.

Number Name ..	..	..	..	..	52 Chewton Dairy 2nd	53 Chewton Rose
Age ..	..	..	..	..	7 yr. 4	6 yr. 6 m. 4
Number of Calves	..	..	..	..	Aug. 8.	Sept. 19.
Last Calved ..	..	..	..	..	61	19
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day	..	..	..	..	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	31.7 29.5	28.6 25.5
Total	..	..	..	..	30.7 29.3	25.5 28.5
Average ..	..	..	..	..	62.4 58.8	54.1 54.0
	..	..	..	..	31.2 29.4	27.0 27.0
Percentage { Fat	..	..	..	..	3.42 4.05	4.13 4.41
Composition of { Solids other than Fat ..	..	..	..	..	8.90 9.05	9.27 9.49
the Milk. { Solids ..	..	..	..	..	12.32 13.10	13.40 13.90
Actual weight of Fat, in lbs.	..	..	..	..	1.07 1.18	1.11 1.19
Calculation of Points multiply by 20	..	..	..	..	21.4 23.6	22.2 23.8
Actual weight of Solids other than Fat, in lbs.	..	..	..	..	2.76 2.46	2.48 2.55
Calculation of Points multiply by 4	..	..	..	..	11.04 10.64	9.92 10.20
Points { For time since Calving ..	..	..	..	..	2.1	—
	..	..	..	..	60.6	54.0
	..	..	..	..	45.0	46.0
	..	..	..	..	21.6	20.1
Total ..	..	..	..	..	129.3	120.1
Deductions ..	..	..	..	..	—	—
Points gained	..	..	..	..	129.3	120.1
Remarks and Awards	..	..	..	..	Very Highly Commended.	Highly Commended.

CLASS 3.—LINCOLNSHIRE RED SHORTHORN COWS.

Number Name ..	..	..	..	54 Bracebridge No. 91	55 Bracebridge No. 5B	56 Bracebridge No. 3B	57 Burton Young Cherry
Age ..	..	..	..	8 yr. 7 m. 2 w. 5	3 yr. 10 m. 2	3 yr. 11 m. Sept. 21. 17	7 yr. 9 m. 2 w. May 28. 133
Number of Calves Last Calved ..	..	..	..	July 20. 80	Aug. 9. 60		
Days since Calving ..	..	..	..	
Weight of Milk, 1st day	..	..	..	Morn. Even. 27.5 26.0	Morn. Even. 25.4 25.9	Morn. Even. 31.2 29.4	Morn. Even. 26.7 23.8
Weight of Milk, 2nd day	..	..	..	27.5 24.0	25.2 24.5	32.4 30.4	25.5 22.6
Total	..	..	..	55.0 50.0	50.6 50.4	63.6 59.8	52.2 46.4
Average ..	..	..	..	27.5 25.0	25.3 25.2	31.8 29.9	26.1 23.2
Percentage	..	..	..	2.80 3.38	2.98 3.64	2.98 3.32	3.18 3.43
Composition of	..	..	..	9.20 9.06	8.96 8.72	8.96 8.88	8.72 8.77
the Milk.	..	..	..	12.00 12.44	11.94 12.36	11.94 12.20	11.90 12.20
Actual weight of Fat, in lbs.	..	..	..	.77 .84	.76 .91	.95 .99	.82 .79
Calculation of Points multiply by 20	..	..	..	15.4 16.8	15.2 18.2	19.0 19.8	16.4 15.8
Actual weight of Solids other than Fat, in lbs.	..	..	..	2.54 2.26	2.26 2.20	2.85 2.66	2.28 2.03
Calculation of Points multiply by 4	..	..	..	10.16 9.04	9.04 8.80	11.40 10.64	9.12 8.12
Points	..	..	..	4.0	2.0	—	9.3
{ For time since Calving	..	..	..	52.5	50.5	61.7	49.3
{ For weight of Milk	..	..	..	32.2	33.4	38.8	32.2
{ For weight of Fat	..	..	..	19.2	17.8	22.0	17.2
{ For weight of Solids other than Fat	..	..	..	107.9	103.7	122.5	108.0
Total ..	..	..	..	10.0	10.0	10.0	—
Deductions ..	..	..	..	97.9	93.7	112.5	108.0
Points gained	..	..	..	
Remarks and Awards	..	..	..				Reserve.

2nd Prize
Reserve for Lord Mayor's
Cup other than Classes
1 and 2

CLASS 3—LINCOLNSHIRE RED SHORTHORN COWS—Continued.

Number Name	58 Burton Nancy III.	59 Burton Nancy IV.	60 Burton Ruby Spod 2nd
Age	4 yr. 2 mo. Aug. 18. 51	7 yr. 3 mo. Sept. 3. 35	6 yr. 5 mo. Sept. 16. 22
Number of Calves
Last Calved
Days since Calving
Weight of Milk, 1st day
Weight of Milk, 2nd day
Total
Average
Percentage { Fat
Composition of { Solids other than Fat
the Milk. { Solids
Actual weight of Fat, in lbs.
Calculation of Points multiply by 20
Actual weight of Solids other than Fat, in lbs
Calculation of Points multiply by 4
Points { For time since Calving
{ For weight of Milk
{ For weight of Fat
{ For weight of Solids other than Fat
Total
Deductions
Points gained
Remarks and Awards

Commended.

1st Prize

and Lord Mayor's Cup for

Classes other than

1 and 2

Commended.

Commended.

Commended.

Commended.

Commended.

Commended.

Commended.

Commended.

Commended.

Commended.

Commended.

CLASS 4.—PEDIGREE SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS).

Number Name ..	63 Astor	64 Wild Cran	65 Babychan Wild Eyeblight	68 Bendyshe Queen
Age ..	2 yr. 10 m. 2 w.	2 yr. 11 m. 2 w.	2 yr. 4 m. 1 w.	2 yr. 7 m. 1 w.
Number of Calves ..	July 21. 79	Aug. 25. 44	Sept. 3. 35	Aug. 10. 59
Last Calved ..				
Days since Calving ..				
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	12.3 10.7	13.1 15.1	11.3 9.6	11.9 13.1
Total ..	13.0 12.3	15.7 17.3	11.4 9.8	14.8 13.1
Average ..	25.3 23.0	28.8 32.4	22.7 19.4	26.7 26.2
Percentage { Fat ..	12.6 11.5	14.4 16.2	11.3 9.7	13.3 13.1
Composition of { Solids other than Fat ..	4.18 3.34	2.76 3.55	3.05 3.68	3.33 4.56
the Milk. { Solids ..	9.10 9.14	9.32 9.45	9.25 9.30	9.55 9.48
Actual weight of Fat, in lbs. ..	13.28 12.48	12.08 13.00	12.30 12.98	12.88 14.04
Calculation of Points multiply by 20 ..	.52 .38	.40 .57	.35 .36	.44 .60
Actual weight of Solids other than Fat, in lbs ..	10.4 7.6	8.0 11.4	7.0 7.2	8.8 12.0
Calculation of Points multiply by 4 ..	1.15 1.05	1.34 1.53	1.04 .90	1.27 1.24
Points { For time since Calving ..	4.60 4.20	5.36 6.12	4.16 3.60	5.08 4.96
For weight of Milk ..	3.9	.4	—	1.9
For weight of Fat ..	24.1	30.6	21.0	26.4
For weight of Solids other than Fat ..	18.0	19.4	14.2	20.8
Total ..	8.8	11.5	7.8	10.1
Deductions ..	54.8	61.9	43.0	59.2
Points gained ..	—	10.0	—	—
Remarks and Awards ..	54.8	51.9	43.0	59.2
	2nd Prize.	Reserve.		1st Prize.

CLASS 4.—PEDIGREE SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS)—Continued.

Number Name .. ..	..	..	..	..	..	69 Matchless 69th 2 yr. 5 m. 3 w. — Sept. 18. 20	70 Abraham Treasure 2 yr. 7 m. 1 w. 1 May 23. 138	71 Abraham Lammernore 2 yr. 7 m. 1 w. 1 May 25. 136
Age .. ..	..	..	..	..	..	Morn. Even.	Morn. Even.	
Number of Calves ..	..	..	..	..	..	8.3 10.1	13.0 11.7	8.4 7.6
Last Calved .. ..	..	..	..	..	..	10.8 10.1	12.7 11.1	8.4 8.5
Days since Calving ..	..	..	..	..	..	19.1 20.2	25.7 22.8	16.8 16.1
Weight of Milk, 1st day	..	..	..	..	..	9.5 10.1	12.8 11.4	8.4 8.0
Weight of Milk, 2nd day	..	..	..	..	..	1.93 3.30	4.72 3.53	3.16 3.21
Total .. ..	..	..	..	..	..	9.25 9.36	8.26 9.45	9.40 9.39
Average .. ..	..	..	..	..	..	11.18 12.66	12.98 12.98	12.56 12.60
Percentage { Fat .. ..	..	..	..	..	..	18 .33	.60 .4	.26 .26
Composition of { Solids other than Fat ..	..	..	..	..	..	3.6 6.6	12.0 8.0	5.2 5.2
the Milk. { Solids .. ..	..	..	..	..	..	.88 .95	1.06 1.08	.79 .75
Actual weight of Fat, in lbs. .. ..	..	..	..	..	..	3.52 3.80	4.24 4.32	3.16 3.00
Calculation of Points multiply by 20 ..	..	..	..	..	..
Actual weight of Solids other than Fat, in lbs.	..	..	..	..	..
Calculation of Points multiply by 4 .. ..	..	..	..	..	..
Points { For time since Calving For weight of Milk For weight of Fat For weight of Solids other than Fat Total Deductions Points gained .. ..	..	..	..	..	..	9.8		9.6
	..	..	..	..	..	19.6	24.2	16.4
	..	..	..	..	..	10.2	20.0	10.4
	..	..	..	..	..	7.3	8.5	6.2
	..	..	..	..	..	37.1	62.5	42.6
Remarks and Awards .. ..	..	..	..	..	..	10.0	10.0	—
	..	..	..	..	..	27.1	52.5	42.6
	..	..	..	..	..		3rd Prize.	

CLASS 5.—SHORTHORN HEIFERS, NOT EXCEEDING THREE YEARS (NOT ELIGIBLE FOR CLASS 4).

Number Name ..	72 Maggie	74 Jessie	75 Burton C Star VII.	76 Burton C Star VIII.
Age ..	2 yr. 10 m. 3 w.	2 yr. 11 m. 2 w.	2 yr. 8 m.	2 yr. 5 m. 3 w.
Number of Calves ..	—	—	—	—
Last Calved ..	Sept. 17.	Aug. 6.	Aug. 19.	Sept. 1.
Days since Calving ..	21	63	50	37
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	20.5 18.8	19.8 20.0	18.0 17.1	20.0 17.8
Total ..	19.7 17.0	21.6 21.4	17.2 15.9	18.4 18.4
Average ..	40.2 35.8	41.4 41.4	35.2 33.0	38.4 36.2
Percentage	20.1 17.9	20.7 20.7	17.6 16.5	19.2 18.1
Composition of	2.93 2.86	3.01 3.32	3.27 4.12	2.88 3.38
the Milk. { Fat ..	9.15 9.04	9.17 9.00	9.37 9.48	9.02 9.22
Actual weight of Fat, in lbs. { Solids ..	12.08 11.90	12.18 12.32	12.64 13.60	11.90 12.60
Calculation of Points multiply by 20 ..	.59 .51	.62 .69	.57 .68	.55 .61
Actual weight of Solids other than Fat, in lbs	11.8 10.2	12.4 13.8	11.4 13.6	11.0 12.2
Calculation of Points multiply by 4 ..	1.85 1.62	1.9 1.87	1.65 1.56	1.74 1.67
Points { For time since Calving ..	7.40 6.5	7.6 7.48	6.60 6.24	6.96 6.68
For weight of Milk ..	—	2.3	1.0	—
For weight of Fat ..	38.0	41.4	34.1	37.3
For weight of Solids other than Fat ..	22.0	26.2	25.0	23.2
Total ..	13.9	15.1	12.8	13.6
Deductions ..	73.9	85.0	72.9	74.1
Points gained ..	20.0	—	—	10.0
Remarks and Awards ..	53.9	85.0	72.9	64.1
	Disqualified.	2nd Prize.	Reserve.	

CLASS 5.—SHORTHORN HEIFERS, NOT EXCEEDING THREE YEARS (NOT ELIGIBLE FOR CLASS 4)—Continued.

Number Name ..	77 Burton Cork VI.	78 Polly	81 —	82 Masie
Age ..	2 yr. 5 m.	2 yr. 11 m. 1 w.	2 yr. 11 m.	2 yr. 9 m.
Number of Calves ..	—	—	—	—
Last Calved ..	Aug. 10. 59	Sept. 13. 25	Sept. 14. 24	July 5. 95
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	18.8 19.2	22.2 20.6	11.3 10.1	16.5 15.9
Total ..	20.7 19.0	25.1 20.8	12.7 12.1	18.6 18.9
Average ..	39.5 38.2	47.3 41.4	24.0 22.2	35.1 34.8
Percentage (Fat ..	19.7 19.1	23.6 20.7	12.0 11.1	17.5 17.4
Composition of Solids other than Fat ..	2.36 4.30	3.95 3.81	4.53 3.35	3.35 3.15
the Milk. / Solids ..	8.98 9.24	9.43 9.15	9.67 9.49	9.11 9.33
Actual weight of Fat, in lbs. ..	11.34 13.54	13.38 12.96	14.20 12.84	12.46 12.48
Calculation of Points multiply by 20 ..	.46 .82	.93 .79	.54 .37	.58 .55
Actual weight of Solids other than Fat, in lbs ..	9.2 16.4	18.6 15.8	10.8 7.4	11.6 11.0
Calculation of Points multiply by 4 ..	1.76 1.76	2.0 1.9	1.15 1.05	1.6 1.02
Points { For time since Calving ..	7.04 7.04	8.0 7.6	4.60 4.20	6.4 6.48
For weight of Milk ..	1.9	—	—	5.5
For weight of Fat ..	38.8	44.3	23.1	34.9
For weight of Solids other than Fat ..	25.6	34.4	18.2	22.6
Total ..	14.0	15.6	8.8	12.9
Deductions ..	80.3	94.3	50.1	75.9
Points gained ..	10.0	—	—	—
Remarks and Awards ..	70.3	94.3	50.1	75.9
		1st Prize.		3rd Prize.

CLASS 6.—JERSEY COWS.

Number Name ..	..	..	..	84 Golden Primrose	85 Majorca	92 Post Obit	93 Guedder Rose
Age ..	..	..	..	4 yr. 7 m. 3 w.	9 yr. 11 m. 2 w.	3 yr. 6 m.	7 yrs.
Number of Calves ..	..	..	..	—	8	2	6
Lost Calved ..	..	..	..	July 15.	July 10.	April 10.	Sept. 12.
Days since Calving ..	..	..	..	85	90	181	26
Weight of Milk, 1st day ..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	..	..	..	19.6 19.8	21.9 18.8	20.4 18.3	19.5 19.8
Total ..	..	..	..	18.3 16.6	20.8 17.4	22.0 17.7	21.0 19.0
Average ..	..	..	..	37.9 36.4	42.7 36.2	42.4 36.0	40.5 38.8
Percentage { Fat	..	..	..	18.9 18.2	21.3 18.1	21.2 18.0	20.2 19.4
Composition of { Solids other than Fat ..	..	..	..	3.05 5.57	5.22 6.66	5.24 6.50	3.24 4.71
the Milk. { Solids ..	..	..	..	9.05 9.01	9.22 9.34	9.36 9.46	9.24 8.83
Actual weight of Fat, in lbs. ..	..	..	..	12.10 14.58	14.44 16.00	14.60 15.96	12.48 13.54
Calculation of Points multiply by 20 ..	..	..	..	.58 1.02	1.11 1.20	1.11 1.17	.65 .91
Actual weight of Solids other than Fat, in lbs	..	..	..	11.6 20.4	22.2 24.0	22.2 23.4	13.0 18.2
Calculation of Points multiply by 4 ..	..	..	..	1.72 1.63	1.97 1.69	1.98 1.52	1.87 1.72
Points { For time since Calving ..	..	..	..	6.88 6.5	7.9 6.8	7.92 6.08	7.48 6.88
{ For weight of Milk ..	..	..	..	4.5	5.0	12.0	—
{ For weight of Fat ..	..	..	..	37.1	39.4	39.2	39.6
{ For weight of Solids other than Fat ..	..	..	..	32.0	46.2	45.6	31.2
Total ..	..	..	..	13.4	14.7	14.0	14.4
Deductions ..	..	..	..	87.0	105.3	110.8	85.2
Points gained ..	..	..	..	87.0	105.3	110.8	85.2
Remarks and Awards ..	..	..	..		2nd Prize.	1st Prize.	

CLASS 6.—JERSEY COWS—Continued.

Number Name ..	..	..	..	94 Unaware	95 Mrs. Viola	96 Lovely Venus	97 L'Autonne Belle
Age ..	..	..	..	6 yr. 6 m. 5	7 yr. 1 m. 4	4 yr. 11 m. 1 w. 4	4 yr. 8 m. 1 w. 3
Number of Calves ..	..	..	..	Aug. 14. 55	Aug. 24. 45	Aug. 17. 52	April 27. 164
Last Calved ..	..	..	..	
Days since Calving ..	..	..	..	
Weight of Milk, 1st day ..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	..	..	..	21.1 18.9	23.3 22.1	22.8 21.5	12.3 10.8
Total ..	..	..	..	20.3 19.3	21.5 17.7	23.9 23.4	12.8 10.7
Average ..	..	..	..	41.4 38.2	44.8 39.8	46.7 44.9	25.1 21.5
Percentage (Fat ..	..	..	..	20.7 19.1	22.4 19.9	23.3 22.4	12.5 10.7
Composition of (Solids other than Fat ..	..	..	..	4.81 4.54	3.60 4.81	3.31 4.02	5.89 5.80
the Milk. (Solids ..	..	..	..	9.41 9.06	9.16 8.83	8.97 8.96	9.49 9.50
Actual weight of Fat, in lbs. ..	..	..	..	14.22 13.60	12.76 13.64	12.28 12.98	15.38 15.30
Calculation of Points multiply by 20 ..	..	..	..	1.00 .86	.81 .96	.77 .90	.74 .62
Actual weight of Solids other than Fat, in lbs ..	..	..	..	20.0 17.2	16.2 19.2	15.4 18.0	14.8 12.4
Calculation of Points multiply by 4 ..	..	..	..	1.95 1.73	2.04 1.77	2.10 2.00	1.19 1.04
Points { For time since Calving ..	..	..	..	7.80 6.92	8.16 7.08	8.4 8.0	4.76 4.16
{ For weight of Milk ..	..	..	..	1.5	.5	1.2	12.0
{ For weight of Fat ..	..	..	..	39.8	42.3	45.7	23.2
{ For weight of Solids other than Fat ..	..	..	..	37.2	33.4	33.4	27.2
Total ..	..	..	..	14.7	15.3	16.4	9.0
Deductions ..	..	..	..	93.2	93.5	96.7	71.4
Points gained ..	..	..	..	—	—	—	—
Remarks and Awards ..	..	..	..	93.2	93.5	96.7	71.4
	..	..	..			3rd Prize.	

CLASS 6.—JERSEY COWS—Continued.

Number Name ..	99 Marion's Hope	104 Exchequer	105 Vile On Bas Belle 2nd	109 Godlington Pipkin 11.
Age ..	5 yr. 4 m.	7 yr. 1 w.	4 yr. 4 m. 3 w.	4 yr. 6 m. 3 w.
Number of Calves ..	3	—	3	3
Last Calved ..	April 2, 189	June 1, 129	Aug. 15, 54	July 22, 78
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	7.4 8.8	15.8 14.1	14.0 15.0	19.4 20.6
Total ..	9.2 8.2	15.8 14.1	13.1 14.6	17.8 17.8
Average ..	16.6 17.0	31.6 28.2	27.1 29.6	37.2 38.4
Percentage of Fat ..	8.3 8.5	15.8 14.1	13.5 14.8	18.6 19.2
Composition of Solids other than Fat ..	7.40 8.72	5.02 4.88	4.30 6.04	3.03 5.92
the Milk. { Solids ..	9.42 9.18	9.04 8.74	9.42 9.10	9.17 9.08
Actual weight of Fat, in lbs. { Solids ..	16.82 17.90	14.06 13.62	13.72 15.14	12.20 15.00
Calculation of Points multiply by 20 ..	.61 .74	.76 .69	.58 .90	.56 1.13
Actual weight of Solids other than Fat, in lbs.	12.2 14.8	15.2 13.8	11.6 18.0	11.2 22.6
Calculation of Points multiply by 4 ..	.78 .78	1.37 1.24	1.27 1.34	1.70 1.73
Points { For time since Calving ..	3.12 3.12	5.48 4.96	5.08 5.36	6.80 6.92
{ For weight of Milk ..	12.0	8.9	1.4	3.8
{ For weight of Fat ..	16.8	29.9	28.3	37.8
{ For weight of Solids other than Fat ..	27.0	29.0	29.6	33.8
Total ..	6.2	10.5	10.5	13.7
Deductions ..	62.0	78.3	69.8	89.1
Points gained ..	62.0	78.3	69.8	89.1
Remarks and Awards ..	..	..	..	..

CLASS 9.—GUERNSEY COWS.

Number Name ..	..	..	..	144 Lady 88	145 Lady Russell	146 Queen of the Roses	147 Hayes Express
Age	..	..	..	5 yr. 5 m. 4	6 yr. 2 m. 4 w. 5	9 yr. 1 w.	4 yr. 2 m.
Number of Calves	..	..	..	Aug. 1. 68	May 19. 142	Sept. 12. 36	July 25. 75
Last Calved ..	..	..	..	
Days since Calving	..	..	..	
Weight of Milk, 1st day	..	..	..	Morn. Even. 21.0 20.6	Morn. Even. 21.3 17.2	Morn. Even. 24.3 23.3	Morn. Even. 13.3 12.7
Weight of Milk, 2nd day	..	..	..	20.3 18.2	5.6 22.6	24.7 22.7	14.6 15.5
Total	..	..	..	41.3 38.8	26.9 39.8	49.0 46.0	27.9 28.2
Average	..	..	..	20.6 19.4	13.4 19.9	24.5 23.0	13.9 14.1
Percentage { Fat	..	..	..	3.95 4.69	4.58 5.00	3.87 4.39	4.56 3.79
Composition of { Solids other than Fat	..	..	..	9.23 9.23	9.76 9.56	9.09 9.21	9.36 9.27
the Milk. { Solids	..	..	..	13.18 13.92	14.34 14.56	12.96 13.60	13.92 13.06
Actual weight of Fat, in lbs.	..	..	..	.81 .91	.61 1.00	.95 1.01	.64 .53
Calculation of Points multiply by 20	..	..	..	16.2 18.2	12.2 20.0	19.0 20.2	12.8 10.6
Actual weight of Solids other than Fat, in lbs.	..	..	..	1.91 1.80	1.31 1.91	2.24 2.12	1.30 1.30
Calculation of Points multiply by 4	..	..	..	7.64 7.20	5.24 7.64	8.96 8.5	5.2 5.20
{ For time since Calving	..	..	..	2.8	10.2	—	3.5
{ For weight of Milk	..	..	..	40.0	33.3	47.5	28.0
{ For weight of Fat..	..	..	..	34.4	32.2	39.2	23.4
{ For weight of Solids other than Fat	..	..	..	14.8	12.8	17.5	10.4
Total ..	..	..	..	92.0	88.5	104.2	65.3
Deductions ..	..	..	..	—	—	—	—
Points gained..	..	..	..	92.0	88.5	104.2	65.3
Remarks and Awards	..	..	..	2nd Prize.	Reserve.	1st Prize.	

CLASS 9.—GUERNSEY COWS—Continued.

Number	..	..	..	..	148
Name ..	..	..	..	..	Flora Dance
Age ..	..	..	..	..	8 yr. 2 m. 2 w.
Number of Calves	..	..	..	..	Sept. 17.
Last Calved ..	..	..	..	..	21
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day	..	..	..	..	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	14.7 13.9
Total	..	..	..	..	14.1 16.3
Average	..	..	..	..	28.8 30.2
Percentage { Fat	..	..	..	..	14.4 15.1
Composition of { Solids other than Fat	..	..	..	..	5.92 5.15
the Milk. { Solids ..	..	..	..	..	9.50 9.27
Actual weight of Fat, in lbs.	..	..	..	..	15.42 14.42
Calculation of Points multiply by 20	..	..	..	..	.85 .78
Actual weight of Solids other than Fat, in lbs.	..	..	..	..	17.0 15.6
Calculation of Points multiply by 4	..	..	..	..	1.37 1.40
{ For time since Calving	..	..	..	..	5.48 5.60
{ For weight of Milk	..	..	..	..	—
{ For weight of Fat ..	..	..	..	..	29.5
{ For weight of Solids other than Fat	..	..	..	..	32.6
Total ..	..	..	..	..	11.1
Deductions ..	..	..	..	..	73.2
Points gained ..	..	..	..	..	73.2
Remarks and Awards	..	..	..	..

Class 11.—RED POLLED COWS.

Number Name ..	150 Atalanta	151 Clarissa	152 Ethel 3rd	153 Rendlesham Abigail
Age ..	8 yr. 8 m. 1 w. 5	8 yr. 9 m. 7	10 yr. 11 m. 1 w. 9	7 yrs. 4
Number of Calves ..	5	164	Aug. 5. 64	Sept. 4. 34
Last Calved ..	July 13. 87	April 27. 164		
Days since Calving ..				
Weight of Milk, 1st day ..	Morn. Even. 21.9 21.2	Morn. Even. 18.6 18.5	Morn. Even. 24.9 20.1	Morn. Even. 22.2 24.5
Weight of Milk, 2nd day ..	18.2 15.8	20.3 18.9	25.1 20.3	24.6 21.7
Total ..	40.1 37.0	38.9 37.4	50.0 40.4	46.8 46.2
Average ..	20.0 18.5	19.4 18.7	25.0 20.2	23.4 23.1
Percentage { Fat ..	3.53 3.64	3.34 3.11	3.48 3.94	2.46 3.55
Composition of { Solids other than Fat ..	8.57 8.60	8.54 8.61	8.76 9.30	9.06 8.95
the Milk. { Solids ..	12.10 12.24	11.88 11.72	12.24 13.24	11.52 12.50
Actual weight of Fat, in lbs. ..	.70 .67	.61 .58	.87 .79	.57 .82
Calculation of Points multiply by 20 ..	14.0 13.4	12.2 11.6	17.4 15.8	11.4 16.4
Actual weight of Solids other than Fat, in lbs ..	1.72 1.50	1.57 1.60	2.20 1.88	2.12 2.06
Calculation of Points multiply by 4 ..	6.88 6.36	6.28 6.40	8.80 7.52	8.48 8.24
{ For time since Calving ..	4.7	12.0	2.4	46.5
{ For weight of Milk ..	38.5	38.1	45.2	27.8
{ For weight of Fat ..	27.4	23.8	33.2	16.7
{ For weight of Solids other than Fat ..	13.3	12.7	16.3	91.0
Total ..	83.9	86.6	97.1	10.0
Deductions ..	—	—	—	81.0
Points gained ..	83.9	86.6	97.1	
Remarks and Awards ..			2nd Prize.	

CLASS 11.—RED POLLED COWS—Continued.

Number Name ..	154 Desire of Johnstown	155 Beauty	156 Ashlyn's Rose 2nd	157 Monia
Age ..	6 yr. 8 m. 1 w. 3	4 yr. 10 m. 1 w. 3	9 yr. 3 m. 3 w. 6	5 yr. 8 m. 2 w. 3
Number of Calves ..	April 23. 168	April 25. 166	Aug. 1. 68	Aug. 15. 54
Last Calved ..	..	..	..	..
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day ..	Morn. Even. 19.0 18.8	Morn. Even. 18.2 16.8	Morn. Even. 22.1 15.5	Morn. Even. 25.2 24.7
Weight of Milk, 2nd day ..	21.8 17.0	17.8 16.0	22.8 18.5	28.0 25.3
Total ..	40.8 35.8	36.0 32.8	44.9 34.0	53.2 50.0
Average ..	20.4 17.9	18.0 16.4	22.4 17.0	26.6 25.0
Percentage { Fat ..	3.91 4.49	3.68 3.62	5.16 3.74	3.07 3.25
Composition of { Solids other than Fat ..	9.37 9.37	8.80 8.94	8.70 8.62	8.93 8.89
the Milk. { Solids ..	13.28 13.86	12.48 12.56	13.86 12.36	12.00 12.14
Actual weight of Fat, in lbs. ..	.80 .80	.66 .59	1.16 .64	.81 .81
Calculation of Points multiply by 20 ..	16.0 16.0	13.2 11.8	23.2 12.8	16.2 16.2
Actual weight of Solids other than Fat, in lbs. ..	1.92 1.68	1.59 1.47	1.95 1.47	2.38 2.22
Calculation of Points multiply by 4 ..	7.68 6.72	6.36 5.88	7.80 5.88	9.52 8.88
{ For time since Calving ..	12.0	12.0	2.8	1.4
{ For weight of Milk ..	38.3	34.4	39.4	51.6
{ For weight of Fat ..	32.0	25.0	36.0	32.4
{ For weight of Solids other than Fat ..	14.4	12.3	13.7	18.4
Total ..	96.7	83.7	91.9	103.8
Deductions ..	—	—	—	—
Points gained ..	96.7	83.7	91.9	103.8
Remarks and Awards ..	3rd Prize.	..	Reserve.	1st Prize.

CLASS 12—RED POLLED HEIFERS (NOT EXCEEDING THREE YEARS).

Number Name ..	..	..	..	..	159 Cranberry	160 Heroine	161 Ashlyn's Queen	163 Randellham's Gipsy
					2 yr. 9 m. Sept. 5. 33	2 yr. 11 m. Sept. 21. 17	2 yr. 6 m. Sept. 7. 31	2 yr. 11 m. 1 w Sept. 12. 26
Age ..	..	..	..	..	Morn. Even. 13.9 13.5 14.2 12.5	Morn. Even. 13.9 12.5 13.7 13.3	Morn. Even. 13.1 12.2 13.6 12.2	Morn. Even. 11.7 13.0 14.3 13.8
Number of Calves ..	..	..	..	..	28.1 26.0	27.6 25.8	26.7 24.4	26.0 26.8
Last Calved ..	..	..	..	..	14.0 13.0	13.8 12.9	13.3 12.2	13.0 13.4
Days since Calving ..	..	..	..	..	3.52 4.13 9.22 9.11 12.74 13.24 .49 .54	4.85 4.08 9.19 9.28 14.04 13.36 .67 .53	3.99 3.78 9.31 9.50 13.30 13.28 .53 .46	2.57 2.66 9.03 8.28 11.60 11.94 .33 .35
Percentage Composition of the Milk.	{ Fat ..	{ Solids ..	{ Other than Fat ..	..	9.8 10.8	13.4 10.6	10.6 9.2	6.6 7.0
Actual weight of Fat, in lbs.	..	..	..	..	1.30 1.19	1.27 1.20	1.24 1.16	1.17 1.11
Calculation of Points multiply by 20	..	..	..	..	5.20 4.76	5.08 4.80	4.96 4.64	4.68 4.44
Actual weight of Solids other than Fat, in lbs	..	..	..	..	..	..	..	..
Calculation of Points multiply by 4	..	..	..	..	..	..	..	..
Points { For time since Calving .. For weight of Milk .. For weight of Fat .. For weight of Solids other than Fat ..	..	..	..	..	27.0	26.7	25.5	26.4
	..	..	..	..	20.6	24.0	19.8	13.6
	..	..	..	..	10.0	9.9	9.6	9.1
	..	..	..	..	57.6	60.6	54.9	49.1
Total ..	..	..	..	..	..	..	..	30.0
Deductions ..	..	..	..	..	57.6	60.6	54.9	19.1
Points gained	..	..	..	..	..	..	..	..
Remarks and Awards	..	..	..	..	..	Reserve.	..	..

CLASS 12.—RED POLLED HEIFERS (NOT EXCEEDING THREE YEARS)—Continued.

Number Name..	..	..	..	..	165 Queen Mab }	166 Sedgemere Moselle	167 Sudbourn Lute I.	168 Sudbourn Princess
					2 yr. 3 m. 1 w. April 17. 174	2 yr. 2 m. 2 w. Sept. 16. 22	2 yr. 11 m. 1 w. July 19. 81	2 yr. 8 m. 2 w. July 22. 78
Age ..	..	..	..	..	Morn. Even. 12.3 12.1 13.6 12.7	Morn. Even. 12.2 11.8 13.1 11.6	Morn. Even. 17.2 14.6 17.1 15.0	Morn. Even. 17.5 16.8 17.4 16.0
Number of Calves ..	..	..	..	..	25.9 24.8	25.3 23.4	34.3 29.6	34.9 32.8
Last Calved ..	..	..	..	..	12.9 12.4	12.6 11.7	17.1 14.8	17.4 16.4
Days since Calving ..	..	..	..	..	4.02 3.94 9.32 9.26 13.34 13.20 .52 .49	3.36 3.09 8.98 8.95 12.34 12.04 .42 .36	4.36 2.95 8.74 8.97 13.10 11.92 .74 .44	3.39 3.59 9.31 9.23 12.70 12.82 .59 .59
Weight of Milk, 1st day ..	..	..	..	..	10.4 9.8	8.4 7.2	14.8 8.8	11.8 11.8
Weight of Milk, 2nd day ..	..	..	..	..	1.20 1.15	1.13 1.05	1.50 1.33	1.62 1.52
Total ..	..	..	..	..	4.80 4.60	4.52 4.20	6.00 5.32	6.48 6.08
Average ..	..	..	..	..	12.0 25.3 20.2 9.4	24.3 ^s 15.6 8.7 48.6	4.1 31.9 23.6 11.3	3.8 33.8 23.6 12.6
Percentage { Fat ..	..	..	..	..	66.9	48.6	70.9	73.8
Composition of { Solids other than Fat ..	..	..	..	..	—	48.6	10.0	—
the Milk. { Solids ..	..	..	..	..	66.9	48.6	60.9	73.8
Actual weight of Fat, in lbs. ..	..	..	..	..	2nd Prize.		3rd Prize.	1st Prize.
Calculation of Points multiply by 20 ..	..	..	..	..
Actual weight of Solids other than Fat, in lbs.	..	..	..	..
Calculation of Points multiply by 4 ..	..	..	..	..
Points { For time since Calving ..	..	..	..	..
{ For weight of Milk ..	..	..	..	..
{ For weight of Fat ..	..	..	..	..
{ For weight of Solids other than Fat ..	..	..	..	..
Total ..	..	..	..	..
Deductions ..	..	..	..	..
Points gained ..	..	..	..	..
Remarks and Awards ..	..	..	..	..

CLASS 13.—AYRSHIRE COWS.

Number Name ..	..	..	..	171 Crocus	173 White Fencer of Dalhousie	174 Dalhousie Daisy Bell
Age ..	..	..	..	6 yr.	8 yr. 4 m. 3 w.	6 yr. 7 m. 1 w.
Number of Calves ..	..	..	..	—	—	—
Last Calved ..	..	..	..	July 27.	Sept. 10.	Sept. 23 (1906).
Days since Calving ..	..	..	..	73	28	380
Weight of Milk, 1st day	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	..	..	..	26.0 23.8	19.8 22.2	4.4 3.7
Total	..	..	..	27.0 26.0	20.1 22.0	4.2 3.7
Average	..	..	..	53.0 49.8	39.9 42.2	8.6 7.4
Percentage (Fat	..	..	..	26.5 24.9	19.9 21.1	4.3 3.7
Composition of { Solids other than Fat	..	..	..	2.84 2.96	2.53 3.65	4.11 4.24
the Milk. { Solids ..	..	..	..	8.30 8.44	9.27 8.95	9.09 9.06
Actual weight of Fat, in lbs.	..	..	..	11.14 11.40	11.80 12.60	13.20 13.30
Calculation of Points multiply by 20	..	..	..	.75 .74	.50 .77	.18 .16
Actual weight of Solids other than Fat, in lbs.	..	..	..	15.0 14.8	10.0 15.4	3.6 3.2
Calculation of Points multiply by 4	..	..	..	2.20 2.10	1.85 1.90	.39 .33
Points { For time since Calving ..	..	..	..	8.8 8.4	7.40 7.60	1.56 1.32
{ For weight of Milk ..	..	..	..	3.3	—	12.0
{ For weight of Fat ..	..	..	..	51.4	41.0	8.0
{ For weight of Solids other than Fat ..	..	..	..	29.8	25.4	6.8
Total ..	..	..	..	17.2	15.0	2.9
Deductions ..	..	..	..	101.7	81.4	29.7
Points gained ..	..	..	..	40.0	10.0	—
Remarks and Awards ..	..	..	..	61.7	71.4	29.7

CLASS 15.—KERRY COWS.

Number Name ..	..	..	..	..	175 Buckhurst Gem	176 Buckhurst Peaceful	177 Buckhurst Waterville Sapphire	178 Walton Joyous
Age ..	..	..	..	..	8 yr. 1 m. 2 w. 6	8 yr. 2 m. 2 w. 5	8 yr. 6	5 yr. 4 m. 3 w.
Number of Calves ..	..	..	..	..	Aug. 23. 46	Aug. 30. 39	July 18. 82	July 12. 88
Last Calved ..	..	..	..	..
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day ..	..	..	..	..	Morn. Even. 23.9 22.8	Morn. Even. 19.5 17.5	Morn. Even. 18.4 17.7	Morn. Even. 22.4 22.4
Weight of Milk, 2nd day ..	..	..	..	..	23.0 22.8	20.0 22.1	19.4 17.5	23.1 20.6
Total ..	..	..	..	..	46.9 45.6	39.5 39.6	37.8 35.2	45.5 43.0
Average ..	..	..	..	..	23.4 22.8	19.7 19.8	18.9 17.6	22.7 21.5
Percentage ..	..	..	..	..	4.36 5.11	3.83 5.21	4.85 5.36	3.09 3.64
Composition of ..	..	..	..	..	9.14 8.61	9.03 9.13	9.41 9.16	8.61 8.60
the Milk. { Solids other than Fat ..	..	..	..	..	13.50 13.72	12.86 14.34	14.26 14.52	11.70 12.24
Actual weight of Fat, in lbs. ..	..	..	..	..	1.03 1.17	.75 1.03	.92 .94	.70 .78
Calculation of Points multiply by 20 ..	..	..	..	..	20.6 23.4	15.0 20.6	18.4 18.8	14.0 15.6
Actual weight of Solids other than Fat, in lbs ..	..	..	..	..	2.14 1.96	1.77 1.80	1.78 1.60	1.95 1.85
Calculation of Points multiply by 4 ..	..	..	..	..	8.6 7.8	7.08 7.2	7.1 6.4	7.80 7.40
{ For time since Calving ..	..	..	..	..	.6	—	4.2	4.8
{ For weight of Milk ..	..	..	..	..	46.2	39.5	36.5	44.2
{ For weight of Fat ..	..	..	..	..	44.0	35.6	37.2	29.6
{ For weight of Solids other than Fat ..	..	..	..	..	16.4	14.3	13.5	15.2
Total ..	..	..	..	..	107.2	89.4	91.4	93.8
Deductions ..	..	..	..	..	—	—	—	—
Points gained ..	..	..	..	..	107.2	89.4	91.4	93.8
Remarks and Awards ..	..	..	..	..	1st Prize.	Reserve, H.C.	3rd Prize.	2nd Prize.

CLASS 15.—KERRY COWS—Continued.

Number	..	..	..	..	..	180
Name ..	..	..	..	..	..	Killarney 4th
Age ..	..	..	..	..	..	8 yr.
Number of Calves	..	..	..	..	..	—
Last Calved ..	..	..	..	..	..	Aug. 22.
Days since Calving	..	..	..	..	..	47
Weight of Milk, 1st day	..	..	..	..	..	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	..	17.5 18.2
Total ..	..	..	..	..	..	18.4 16.2
Average ..	..	..	..	..	..	35.9 34.4
Percentage (Fat	..	..	..	..	..	17.9 17.2
Composition of } Solids other than Fat	..	..	..	..	..	3.25 4.33
the Milk. } Solids ..	..	..	..	..	..	9.17 8.97
Actual weight of Fat, in lbs.	..	..	..	..	..	12.42 13.30
Calculation of Points multiply by 20	..	..	..	..	..	.58 .74
Actual weight of Solids other than Fat, in lbs	..	..	..	..	..	11.6 14.8
Calculation of Points multiply by 4	..	..	..	..	..	1.62 1.54
{ For time since Calving	..	..	..	..	..	6.48 6.16
{ For weight of Milk	..	..	..	..	..	.7
{ For weight of Fat	..	..	..	..	..	35.1
{ For weight of Solids other than Fat	..	..	..	..	..	26.4
Total ..	..	..	..	..	..	12.7
Deductions	..	..	..	..	..	74.9
Points gained..	..	..	..	..	..	—
Remarks and Awards	..	..	..	..	..	74.9

CLASS 16.—DEXTER COWS.

Number Name ..	183 Compton Dark Beauty	184 Compton Doola	186 Henley Sardis	187 Compton Deseo
Age ..	7 yr. 5	3 yr. 7 m. 2	7 yr. 6	5 yr. 4
Number of Calves ..	July 29. 71	Aug. 25. 44	June 7. 123	May 12. 149
Last Calved ..				
Days since Calving ..				
Weight of Milk, 1st day ..	Morn. Even. 21.0 19.5	Morn. Even. 13.9 16.6	Morn. Even. 14.4 13.6	Morn. Even. 14.4 13.9
Weight of Milk, 2nd day ..	21.2 19.1	17.1 15.0	14.3 13.4	12.9 13.9
Total ..	42.2 38.6	31.0 31.6	28.7 27.0	27.3 27.8
Average ..	21.1 19.3	15.5 15.8	14.3 13.5	13.6 13.9
Percentage (Fat ..	3.65 4.20	3.09 3.60	3.30 3.13	3.62 3.60
Composition of { Solids other than Fat ..	9.29 9.08	9.63 9.56	8.64 8.47	8.94 8.80
the Milk. { Solids ..	12.94 13.28	12.72 13.16	11.92 11.60	12.56 12.40
Actual weight of Fat, in lbs. ..	.77 .81	.48 .57	.47 .42	.49 .50
Calculation of Points multiply by 20 ..	15.4 16.2	9.6 11.4	9.4 8.4	9.8 10.0
Actual weight of Solids other than Fat, in lbs. ..	1.96 1.75	1.50 1.51	1.23 1.14	1.21 1.22
Calculation of Points multiply by 4 ..	7.84 7.00	6.00 6.04	4.92 4.56	4.84 4.88
{ For time since Calving ..	3.1	.4	8.3	10.9
{ For weight of Milk ..	40.4	31.3	27.8	27.5
{ For weight of Fat ..	31.6	21.0	17.8	19.8
{ For weight of Solids other than Fat ..	14.8	12.0	9.5	9.7
Total ..	89.9	64.7	63.4	67.9
Deductions ..	—	—	10.0	—
Points gained ..	89.9	64.7	53.4	67.9
Remarks and Awards ..	1st Prize.			

CLASS 16.—DEXTER COWS—Continued.

Number Name ..	..	..	..	188 Aiene Big	189 Compton Dazzle	190 Acton Gipsy	191 Buckhurst Juno
				8 yr. — March 3. 219	7 yr. — March 13. 209	3 yr. 5 m. — Aug. 5. 64	6 yr. 3 m. 2 w. — June 27. 103
Age ..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Number of Calves ..	..	..	..	13.9 13.3	13.1 12.8	14.7 11.9	22.4 19.1
Last Calved ..	..	..	..	15.4 13.9	13.6 11.8	14.1 11.9	21.1 19.9
Days since Calving ..	..	..	..	29.3 27.2	26.7 24.6	28.8 23.8	43.5 39.0
Weight of Milk, 1st day	..	..	..	14.6 13.6	13.3 12.3	14.4 11.9	21.7 19.5
Weight of Milk, 2nd day	..	..	..	4.10 3.57	4.54 4.20	4.23 3.61	3.04 3.15
Total	..	..	..	9.34 9.43	8.90 9.06	8.71 9.19	9.10 8.85
Average ..	..	..	..	13.44 13.00	13.44 13.26	12.94 12.80	12.14 12.00
Percentage { Fat	..	..	..	.60 .49	.6 .52	.61 .43	.66 .61
Composition of { Solids other than Fat	..	..	..	12.0 9.8	12.0 10.4	12.2 8.6	13.2 12.2
the Milk. { Solids ..	..	..	..	1.36 1.28	1.18 1.11	1.25 1.10	1.97 1.72
Actual weight of Fat, in lbs.	..	..	..	5.44 5.12	4.72 4.44	5.00 4.4	7.88 6.88
Calculation of Points multiply by 20	..	..	..	12.0	12.0	2.4	6.3
Actual weight of Solids other than Fat, in lbs	..	..	..	28.2	25.6	26.3	41.2
Calculation of Points multiply by 4	..	..	..	21.8	22.4	20.8	25.4
Points { For time since Calving ..	..	..	..	10.5	9.1	9.4	14.8
{ For weight of Milk ..	..	..	..	72.5	69.1	58.9	87.7
{ For weight of Fat ..	..	..	..	—	—	—	—
{ For weight of Solids other than Fat	..	..	..	72.5	69.1	58.9	87.7
Total ..	..	..	..	72.5	69.1	58.9	87.7
Deductions ..	..	..	..	—	—	—	—
Points gained ..	..	..	..	72.5	69.1	58.9	87.7
Remarks and Awards ..	..	..	..	—	—	—	2nd Prize.

CLASS 22.—GOATS (ANY VARIETY).

Number	..	..	..	238	239	240	243
Name ..	..	..	..	Sedgemere Faith	Fairy	Montbretia	Sedgemere Capella
Age ..	..	..	..	—	—	—	—
Number of Kids ..	..	..	..	April 2.	March 12.	Feb. 6.	April 8.
Last Kided ..	..	..	..	189	210	244	183
Days since Kidding ..	..	..	..	
Weight of Milk, 1st day ..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	..	..	..	3.9 3.7	1.3 1.5	1.5 1.5	4.7 4.3
Total ..	..	..	..	4.0 3.1	1.5 .9	1.5 1.0	4.4 3.7
Average ..	..	..	..	7.9 6.8	2.8 2.4	3.0 2.5	9.1 8.0
Percentage	..	..	..	3.95 3.4	1.4 1.2	1.5 1.25	4.55 4.0
Composition of	..	..	..	3.64 3.58	3.41 2.72	5.57 5.83	3.21 3.11
the Milk. { Solids other than Fat ..	..	..	..	8.04 8.08	8.39 8.28	9.45 9.27	8.05 7.99
Actual weight of Fat, in lbs. ..	..	..	..	11.68 11.66	11.80 11.00	15.02 15.10	11.26 11.10
Calculation of Points multiply by 20 ..	..	..	..	.144 .122	.048 .032	.083 .073	.146 .124
Actual weight of Solids other than Fat, in lbs	..	..	..	2.88 2.44	.96 .64	1.66 1.46	2.92 2.48
Calculation of Points multiply by .4 ..	..	..	..	.318 .275	.118 .100	.142 .116	.307 .320
Points { For time since Kidding ..	..	..	..	1.272 1.100	.472 .4	.568 .464	1.468 1.28
For weight of Milk ..	..	..	..	3.15	3.50	4.06	3.05
For weight of Fat ..	..	..	..	7.35	2.60	2.75	8.55
For weight of Solids other than Fat ..	..	..	..	5.32	1.60	3.12	5.40
Total ..	..	..	..	2.37	.87	1.03	2.75
Deductions ..	..	..	..	18.19	8.57	10.96	19.75
Points gained	..	..	..	2.00	2.0	—	2.0
Remarks and Awards ..	..	..	..	16.19	6.57	10.96	17.75
	..	..	..	2nd Prize, and Reserve for Baroness Burdett Coutts' Cup.			1st Prize, and Baroness Burdett Coutts' Cup.

CLASS 22.—GOATS (ANY VARIETY)—Continued.

Number	..	..	..	257	265
Name ..	..	..	..	Broxbourne Verne	Druidstone San Toy
Age ..	..	..	..	—	—
Number of Kids ..	..	..	..	March 24,	Aug. 28,
Last Kiddled ..	..	..	..	198	41
Days since Kidding ..	..	..	..
Weight of Milk, 1st day	..	..	..	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	..	..	..	1.5 1.4	1.4 1.5
Total	..	..	..	1.5 .9	1.7 1.1
Average ..	..	..	..	3.0 2.3	3.1 2.6
Percentage { Fat	..	..	..	1.5 1.15	1.55 1.3
Composition of { Solids other than Fat	..	..	..	3.81 3.22	5.47 6.34
the Milk. { Solids ..	..	..	..	8.47 8.38	9.31 9.26
Actual weight of Fat, in lbs.	..	..	..	12.28 11.60	14.78 15.60
Calculation of Points multiply by 20	..	..	..	.057 .037	.085 .082
Actual weight of Solids other than Fat, in lbs	..	..	..	1.14 .74	1.70 1.64
Calculation of Points multiply by 4	..	..	..	.127 .096	.144 .120
Points { For time since Kidding	..	..	..	.508 .384	.576 .48
{ For weight of Milk	..	..	..	3.30	.68
{ For weight of Fat	..	..	..	2.65	2.85
{ For weight of Solids other than Fat	..	..	..	1.88	3.34
Total ..	..	..	..	.89	1.06
Deductions ..	..	..	..	8.72	7.93
Points gained ..	..	..	..	2.0	—
Remarks and Awards	..	..	..	6.72	7.93

THE BUTTER TESTS OF 1907.

By R. H. EVANS, B.Sc.

Out of 77 entries, 61 cows were present to compete for the prizes offered in the Butter Test Classes. This number shows a decrease of seven on the number of cows taking part in the previous year's competition, a decrease partly due to the rearrangement of classes. No Cross-breds were eligible, and the Lincoln Reds were no longer placed among the Shorthorns, but were included in the "any other breed" class.

The cream from the milk of one cow (No. 163) showed the phenomenon which is occasionally met with of being practically unchurnable. This cow is not taken into consideration in the working out of the averages for the breed to which she belongs.

The Shorthorns (26 in number) were a good lot of animals, and compare very favourably with those tested at previous shows. The average yield of butter in this section is 1 lb. 11 $\frac{3}{4}$ ozs., as against 1 lb. 6 $\frac{3}{4}$ ozs. yielded in 1906. The average number of points has only twice been exceeded since 1895. The outstanding feature in the Shorthorn Class—as well as in the whole Show—was the enormous quantity of butter yielded by Mr. George B. Nelson's "Daisy" (No. 37). From the total yield of 61 lbs. 2 oz. of milk—approximately 6 gallons—in the course of 24 hours, showing 5.84 per cent. and 6.90 per cent. of butter-fat in the morning's and evening's milk respectively, 4 lbs. $\frac{1}{4}$ oz. of butter was obtained, which was good both in colour and quality. Besides taking the first place in her class, she also brought to her owner the Barham Challenge Cup, the Lord Mayor's Shorthorn Cup, and the Spencer Challenge Cup. It would be very interesting to know whether this phenomenal yield is consistent during the whole lactation period or not. The question of following up such cows as No. 37, and the advisability of taking a series of three or four tests during the lactation period, is worthy of consideration. Such tests would not only prove of interest, but would also help to throw some light on the possibility of cows yielding an abnormal amount of butter-fat for a comparatively short time. It would also prove of great interest if information could be obtained as to the treatment and feeding of this particular cow previous to, and after calving; as to the length of time she was allowed to run dry before calving, etc. etc.

The Lincoln Red Shorthorns, though a small class—only seven in number—did exceedingly well; and when we consider that this is the first year they have been classed as a separate breed, the exhibitors are to be congratulated on the results obtained, which compare very favourably with those of the other breeds. An average yield of 1 lb. 13½ ozs. of butter, with a butter ratio of 28·31, is in itself sufficient to show the high quality of the milk produced by these animals. Mr. J. Evens' "Burton Nancy 4th" yielded 2½ lbs. of butter, and obtained a total of 40 points.

The Jerseys were up to their usual average, and once more proved themselves persistent milkers and excellent butter producers. They obtained the highest average number of points of any breed in the trials.

The most conspicuous improvement is met with in the case of the Red Polls. In the yield of butter, butter ratio, and total number of points, they show a decided improvement upon last year's figures.

In the Guernsey Class only two cows took part in the competition, and Sir Henry F. Lennard's "Lady Russel," 142 days in milk, yielded 1 lb. 14 ozs. of butter, and scored a total of 40·2 points.

Of the two Kerries tested, Countess de la Warr's "Buckhurst Waterville Sapphire" yielded 2 lbs. ½ oz. of butter in the course of 24 hours, which is a remarkable yield when the size of the animal is considered.

The trials were carried out on the same lines as in previous years, the scale of awarding points being as follows :—

One point for every ounce of butter; one point for every completed 10 days' since calving, deducting the first 40 days. Maximum allowance for period of lactation, 12 points. Fractions of ounces of butter, and incomplete periods of less than 10 days, to be worked out in decimals, and added to the total points. In the case of cows obtaining the same number of points, the prize to be awarded to the cow that has been the longest time in milk.

No prize or certificate to be given in the case of :—

- (a) Cows under five years old failing to obtain 28 points, or in the case of Jerseys 30 points.
- (b) Cows five years old and over failing to obtain 32 points, or in the case of Jerseys 35 points.

The results of the tests will be found in the following tables :—

BUTTER TEST—SHORTHORNS—Continued.

No. in Catalogue	Exhibitor and Name of Cow	Age on Sept. 1st	Date of last Calf	Number of days in Milk	Milk yield in 24 hrs.	Butter yield	Milk to lbs. Butter, viz. lbs.	Colour	Quality	No. of Points for Butter	No. of Points for Lactation	Total number of Points	Awards
		y. m. w.			lbs. ozs. lbs. ozs.								
34	Allan Skelton's Daisy	6 0 0	July 29	71	33 9 1	5 1	39.77	Good V.	Good	22.50	3.1	25.60	
36	George B. Nelson's Dot	6 0 0	June 15	115	42 3 1	4 1	32.92	V. Good	Good	20.50	7.5	28.00	
37	George B. Nelson's Daisy	7 0 0	Aug. 27	42	61 2 4	0 1	15.22	Good	Good	64.25	2	64.45	1st Prize & Silver Medal
38	George B. Nelson's Sally	6 0 0	Sept. 4	34	48 5 1	6	35.13	Good	Good	22.00	—	22.00	
40	Dunbar Kelly's Sweetheart	7 0 0	June 4	126	66 6 1	15	34.25	V. Pale	Good	31.00	8.6	39.60	
41	Dunbar Kelly's Coombe Star	5 0 0	July 14	86	48 6 1	2 1	41.83	Pale	Fair	18.50	4.6	23.10	
46	Frank Brown's Flo	6 3 0	Aug. 31	38	37 3 1	6 1	26.74	Good V.	Good	22.25	—	22.25	
47	Frank Brown's Maud	6 0 0	Sept. 11	27	51 5 1	7 1	34.93	Pale	Good	23.50	—	23.50	
48	William Nisbet's Polly 1st	9 4 0	Aug. 9	60	50 10 1	15	26.12	V. Pale	Fair	31.00	2.0	33.00	
50	William Nisbet's Nancy	4 3 0	Aug. 7	62	52 0 1	2	46.22	Pale	Fair	18.00	2.2	20.20	
51	John Wilson's	5 4 0	Sept. 6	32	66 9 2	11 1	24.62	Good	Fair	43.25	—	43.25	2nd Prize and Bronze Medal
52	James Sheppy's Chewton Daisy 2nd	7 0 0	Aug. 8	61	61 3 2	8 1	24.17	V. Good	V. Good	40.50	2.1	42.60	Reserve & V.H.C
53	James Sheppy's Chewton Rose	6 6 0	Sept. 19	19	54 2 2	8 1	21.25	Ex't	Ex't	40.75	—	40.75	V.H. Commended

* About.

BUTTER TEST—SHORTHORNS—Continued.

No. in Catalogue	Name of Cow	CHURNING—TIME AND TEMPERATURE				
		Time		Temperature		
		Churning began	Churning finished	Duration of Churning	Dairy	Cream and Churn
				Minutes	Degrees	Degrees
3	Comely Maid	9 29	10 7	38	65	57
4	Waterloo Rose 4th	9 31	10 28	57	65	54
5	Fearless	9 23	9 55	32	65	54
6	Blossom 5th	10 52	11 13	21	67	53
7	Tulip 7th	9 35	10 5	30	65	54
12	Red Rose 3rd	10 5	10 34	29	66	52
14	Dorothy	10 15	10 52	37	66	54
15	Melody	10 18	10 40	22	66	54
17	Darlington Cranford 11th	10 20	11 5	45	66	57
19	Everby Sweet Duchess 2nd	11 42	12 14	32	67	56
20	Everby Beauty	11 45	12 20	35	68	57
21	Red Millicent 3rd	11 41	11 59	18	67	55
28	Lanesdale Lady	10 49	11 52	26	67	55
34	Daisy	11 28	12 13	45	67	57
36	Dot	11 9	11 29	20	67	55
37	Daisy	11 5	11 26	21	67	55
38	Sally	11 26	12 7	41	67	55
40	Sweetheart	11 20	12 21	61	67	60
41	Coombe Star	11 27	11 44	17	67	54
46	Flo	11 35	12 12	37	67	54
47	Maud	2 6	2 20	14	69	54
48	Polly 1st	2 4	3 20	76	69	54
50	Nancy	11 48	12 3	15	68	64
51	Chewton Daisy 2nd	2 14	2 43	29	69	54
53	Chewton Rose	2 10	2 44	34	69	54

BUTTER TEST—JERSEYS.

Exhibitor and Name of Cow	Date of Birth	Date of last Calf	Number of days in milk	Milk yield in 24 hrs.		Butter yield	Ratio, viz. lbs. milk to lb. butter	Colour and Quality of Butter	No. of points for butter	No. of points for period of lactation	Total number of points	Awards
				lbs	ozs			Colour				
Sir John Hollans' Golden Primrose	Jan. 14, 1903	July 15	86	39	61	11½	23-11	Very Good	27-25	4-60	31-85	Certificate of Merit
Mrs. Watson Kennedy's Majoreca	Sept. 11, 1897	July 10	91	40	11-2	9½	15-78	Good V. Good	41-25	5-10	46-35	2nd Prize, Silver Medal & £5
Admiral The Hon. T. S. Brand's Geranium	Nov. 10, 1902	June 20	111					Withdrawn				
J. H. Smith-Barry's Post Obit	Mar. 23, 1904	April 10	182	38	11-2	4½	16-84	Very Good	36-75	12-00	48-75	1st Prize, Gold Medal or £10, & £1 Butter Prize
R. Bruce Ward's Mrs. Viola	Aug. 1, 1900	Aug. 24	46	45	7-2	0½	22-54	Do.	32-25	60	32-85	
R. Bruce Ward's Lovely Venus	Sept. 24, 1902	Aug. 17	53	44	5-1	12	25-32	Good V. Good	28-00	1-30	29-30	
R. Bruce Ward's L'Aumône Belle	1903	April 27	165	23	1-1	7½	15-70	Pale V. Good	23-50	12-00	35-50	Certificate of Merit
O. F. Mosley's Marion's Hope	1899	April 2	190	16	3-1	4½	12-48	Very Good	20-75	12-00	32-75	
F. Bateman's Exchequer	Mar. 23, 1900	June 1	130	29	15-1	10	18-42	Good	26-00	9-00	35-00	Certificate of Merit
A. Miller-Hallett's Goddington Pipkin	Feb. 27, 1903	July 22	79	40	1-1	13½	21-54	Very Good	29-75	3-90	33-65	Certificate of Merit
J. H. Smith-Barry's Marionette	Oct. 3, 1904	July 26	75	33	5-1	11½	19-20	V. Pale Good	27-75	3-50	31-25	
H. P. Smith's Sea Swallow	Mar. 17, 1905	Aug. 10	60	33	5-1	5½	25-08	Good V. Good	21-25	2-00	23-25	Certificate of Merit
Mrs. Eyres Monsell's White Heather	1905	June 10	121	25	13-1	5½	18-98	Pale	Good 21-75	8-10	29-85	
O. F. Mosley's Loulah 3rd	1904	April 26	166	36	0-1	10	22-15	Very Good	26-00	12-00	38-00	3rd Prize, Bronze Medal & £3

BUTTER TEST—JERSEYS—Continued.

No. in Catalogue	Name of Cow.	CHURNING—TIME AND TEMPERATURE					
		Time		Temperature			
		Churning began	Churning finished	Duration of Churning	Dairy	Cream and Churn	Buttermilk, when churning finished
				Minutes	Degrees	Degrees	Degrees
84	Golden Primrose	9 0	9 18	18	60	52	53
85	Majorca	9 5	9 30	25	62	52	54
86	Geranium	With drawn		—	—	—	—
92	Post Orbit	9 10	9 43	33	64	52	58
95	Mrs. Viola	9 17	10 0	43	64	52	57
96	Lovely Venus	9 25	9 50	25	65	52	54
97	L'Aumône Belle	9 42	10 6	24	66	52	58
99	Marion's Hope	9 52	10 7	15	66	52	55
104	Exchequer	10 3	11 9	66	66	52	57
109	Goddington Pipkin	10 16	10 41	25	66	52	54
112	Marionette	10 25	11 12	47	66	52	54
120	Sea Swallow	10 33	11 23	50	67	52	55
121	White Heather	10 37	11 4	27	67	52	56
143	Louah 3rd	10 47	11 33	46	67	52	55

BUTTER TEST—COWS AND HEIFERS OTHER THAN SHORTHORNS OR JERSEYS.

No. in Catalogue	Exhibitor and Name of Cow	Age on Sept. 1st	Date of last Calf	Days in milk	Milk yield in 24 hrs		Butter yield	Ratio, viz., lbs. milk to lb. butter	Colour and Quality of Butter.		No. of points for butter	No. of points for lactation	Total number of points	Awards
					lbs	ozs			Colour	Quality				
* 54	Frederick Scorer's Bracebridge No. 91	8 7	2 July 20	80	53	8 1	11 ³ / ₈	30-84	Good	Good	27-75	4-0	31-75	H. Commended
* 55	Frederick Scorer's Bracebridge No. 5B	3 10	0 Aug. 9	60	51	6 1	13 ³ / ₈	27-63	Good	Good	29-75	2-0	31-75	H. Commended
* 56	Frederick Scorer's Bracebridge No. 3 ⁿ	3 11	0 Sept. 21	17	60	11 2	1 ¹ / ₂	28-98	Good	Good	33-50	—	33-50	V.H. Commended
* 57	Miss K. Carleton's Burton Young Cherry	7 9	2 May 28	133	50	9 1	11	29-96	Good	Fair	27-00	9-3	36-30	2nd Prize £1
* 58	John Evens' Burton Nancy 3rd ..	4 2	0 Aug. 18	51	47	11 1	10 ¹ / ₂	28-79	Good	Fair	26-50	1-1	27-60	
* 59	John Evens' Burton Nancy 4th ..	7 3	0 Sept. 3	35	52	0 2	8	20-80	Good	Good	40-00	—	40-00	1st Prize £3
* 60	John Evens' Burton Ruby Spot 2nd	6 5	0 Sept. 16	22	50	9 1	6 ¹ / ₂	35-95	Good	Fair	22-50	—	22-50	
† 145	Sir H. F. Lennard's Lady Russell..	6 2	4 May 19	142	38	8 1	14	20-53	V Good	V Good	30-00	10-2	40-20	Prize £3
† 148	Hon. Rose E. Hubbard's Flora Dance	8 2	2 Sept. 17	21	28	9 1	10 ¹ / ₂	17-08	Ex ^t Int	Ex ^t Int	26-75	—	26-75	
† 150	Lord Rothschild's Alalanta ..	8 8	1 July 13	87	43	1 1	6 ¹ / ₂	30-62	Good	Fair	22-50	4-7	27-20	
† 151	Lord Rothschild's Clarissa ..	8 9	0 April 27	164	37	2 1	0	37-20	Pale	Fair	16-00	12-0	28-00	H. Commended
† 152	Lord Rothschild's Ethel 3rd ..	10 11	1 Aug. 5	64	45	0 1	9	28-80	Good	Good	25-00	2-4	27-40	

* Lincoln Red Shorthorns.

† Guernseys.

‡ Red Polled Cows.

BUTTER TEST—COWS AND HEIFERS OTHER THAN SHORTHORNS AND JERSEYS—Continued.

No. in Catalogue	Exhibitor and Name of Cow	Age on Sept. 1st	Date of last Calf	Days in milk	Milk yield in 24 hrs.	Butter yield	Ratio, viz., lbs. milk to lb. butter	Colour and Quality of Butter	No. of points for Butter	No. of points for Lactation	Total number of points	Awards
								Colour	Quality			
†153	Alfred J. Smith's Rendlesham Abigail	7 0	0 Sept.	4 34	46 11 1	2 41	50	Pale	Good	18.00	—	18.00
†154	Sir Walter Corbet's Desiree of Johnstown	6 8	1 April	23 168	37 13 1	6 1 26	88	V Good	V Good	22.50	12.0	34.50 Prize £3
†155	Sam Woodwiss' Beauty	4 10	1 April	25 166	35 00	15 35	55	V. Pale	Fair	15.75	12.0	27.75
†156	Earl of Radnor's Ashlyns Rose 2nd	9 3	3 Aug.	1 68	37 10 1	3 3 30	48	Good	Fair	19.75	2.8	22.55
†157	Earl of Radnor's Mona	5 8	2 Aug.	15 54	49 14 1	2 1 43	13	Good	Fair	18.50	1.4	19.90
§161	Sir Richard Cooper's Ashlyns Queen	2 6	0 Sept.	7 31	25 50	13 30	56	V. Pale	Fair	13.25	—	13.25
§163	Alfred J. Smith's Rendlesham Snowdrop	2 11	1 Sept.	12 26	24 11	Cream practically unobtainable						
§165	A. Carlyle Smith's Queen Mab	2 3	1 April	17 174	24 70	14 26	50	V. Pale	Good	14.75	12.0	26.75
§168	Kenneth N. Clark's Sudbourne Princess	2 8	2 July	22 78	34 50	14 37	86	V. Pale	Good	14.50	3.8	18.30
||177	Muriel Countess de la Warr's Buckhurst Waterville Sapphire	8 0	0 July	18 82	36 12	0 17	75	V Good	V Good	32.50	4.2	36.70 Prize £3
||180	Duchess of Newcastle's Killarney 4th	8 0	0 Aug.	22 47	35 11 1	6 25	95	Good V.	Good	22.00	.7	22.70
												§ Kerry.
												† Red Polled Cows, § Red Polled Heifers.

BUTTER TEST—COWS OTHER THAN SHORTHORNS OR JERSEYS—Continued.

No. in Catalogue	Name of Cow	CHURNING—TIME AND TEMPERATURE					
		Time		Duration of Churning	Temperature		
		Churning began	Churning finished		Dairy	Cream and Churn	
				Minutes	Degrees	Degrees	Buttermilk, when churning finished
* 54	Bracebridge No. 91	2 10	2 38	28	69	52	50
* 55	Bracebridge No. 5B	2 2	2 35	33	69	52	54
* 56	Bracebridge No. 3B	2 8	2 31	23	69	52	54
* 57	Burton Young Cherry	2 31	3 9	38	69	52	53
* 58	Burton Nancy 3rd	2 13	2 45	32	69	52	58
* 59	Burton Nancy 4th	3 45	4 6	21	69	52	54
* 60	Burton Ruby Spot 2nd	2 15	2 34	19	69	52	54
† 145	Lady Russell	3 34	4 10	36	69	52	57
† 148	Flora Dance	2 18	3 15	57	69	52	58
† 150	Atalanta	2 54	3 17	23	69	52	56
† 151	Clarissa	3 35	3 55	20	69	52	56
† 152	Ethel 3rd	3 47	5 0	73	69	52	62
† 153	Rendlesham Abigail	2 52	3 6	14	69	52	57
† 154	Desiree of Johnstown	2 47	3 30	43	69	52	57
† 155	Beauty	3 45	4 20	35	69	52	58
† 156	Ashlyns Rose 2nd	2 46	3 8	22	69	52	57
† 157	Mona	3 14	3 31	17	69	52	55
† 161	Ashlyns Queen	3 23	4 2	39	69	52	58
† 163	Rendlesham Snowdrop	2 56	4 36	100	69	52	56
† 165	Queen Mab	2 58	3 28	30	69	52	56
† 168	Sudbourne Princess	3 25	4 35	70	69	52	56
† 177	Buckhurst Waterville Sapphire	3 1	3 18	17	69	52	55
† 180	Killarney 4th	3 44	4 44	60	69	52	60

* Lincoln Red Shorthorns.

† Guernseys.

‡ Red Polled Cows.

§ Red Polled Heifers.

Kerry.

TABLE I.—NUMBER OF CATTLE TESTED SINCE 1897.

Breed	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907
Shorthorns	9	23	21	22	15	31	18	14	17	22	26
Lincoln Reds	—	—	—	—	—	—	—	—	—	—	7
Jerseys	14	17	15	29	25	30	20	12	18	13	13
Guernseys.....	3	5	4	7	8	1	5	3	3	2	2
Red Polls	7	4	9	7	2	6	5	4	11	12	11
Ayrshires	3	1	2	—	1	1	—	1	3	2	0
South Devons	—	—	—	—	—	—	2	2	3	5	0
Dutch.....	1	—	—	—	—	—	1	—	—	—	0
Kerries and Dexters	—	1	2	—	1	2	—	2	1	2	2
Welsh.....	—	1	1	1	—	—	—	—	—	—	—
Cross-breds	4	1	6	2	2	11	8	6	8	10	—
	41	53	60	68	54	82	59	44	64	68	61

TABLE II.—NUMBER OF CATTLE OF THE VARIOUS BREEDS TESTED
SINCE 1895, WITH THEIR AVERAGE PERIOD OF LACTATION,
WEIGHT OF BUTTER, BUTTER RATIOS, AND POINTS.

Year	No.	Breed	Average No. of Days in Milk	Average Weight of Butter	Average Butter Ratio	Average No. of Points
				lbs. ozs.	lbs.	
From 1895 to 1900	106	Shorthorns...	50½	1 11	28·81	—
1901	15	"	44	2 0½	26·69	33·69
1902	31	"	50	1 11½	27·38	23·89
1903	18	"	41	1 11	38·59	23·44
1904	14	"	41½	1 10	29·31	27·47
1905	17	"	53	1 13½	27·65	31·25
1906	22	"	58	1 6½	32·87	25·08
1907	26	"	62	1 11½	29·23	30·24
" 1907	7	Lincoln Reds	57	1 13½	28·31	31·91
" 1895 to 1900	126	Jerseys ...	99	1 10½	19·15	—
1901	25	"	141	1 9½	17·80	34·44
1902	30	"	124	1 10	18·46	33·19
1903	20	"	141	1 11	18·12	36·13
1904	12	"	117	1 13½	19·62	36·79
1905	18	"	134	1 10½	19·48	35·51
1906	13	"	119	1 10½	20·89	33·49
1907	13	"	111	1 11	19·71	34·49
" 1895 to 1900	23	Guernseys ...	71½	1 9½	21·86	—
1901	8	"	81	1 8½	21·43	29·51
1902	1	"	17	1 8½	21·46	19·75
1903	5	"	52	1 1	27·77	18·93
1904	3	"	98½	1 10	20·65	31·91
1905	3	"	165½	1 6½	19·66	31·78
1906	2	"	133	1 3½	27·00	28·45
1907	2	"	82	1 12½	18·90	33·48
" 1895 to 1900	30	Red Polls ...	60½	1 4½	30·29	—
1901	2	"	80	1 8½	25·50	28·77
1902	6	"	83	1 6½	26·84	26·92
1903	5	"	124	1 0	39·60	21·39
1904	4	"	115½	1 5½	30·34	29·06
1905	11	"	74½	1 3½	28·78	22·76
1906	12	"	76	0 15	39·15	18·81
1907	11	"	99	1 2½	33·21	23·96
" 1896 to 1900	8	Ayrshires ...	52	1 13½	26·35	—
1901	1	"	125	1 7½	27·65	32·10
1902	1	"	33	1 3½	18·00	19·50
1903	0	"	—	—	—	—
1904	1	"	116	0 12½	35·20	20·10
1905	3	"	77	1 2½	28·07	22·88
1906	2	"	23	1 11½	25·51	27·75
1907	—	"	—	—	—	—
" 1896 to 1900	3	Dexters and Korries	117	0 14½	40·80	—
1901	1	"	83	1 6½	21·17	26·55
1902	2	"	46	1 7½	21·28	23·49
1903	0	"	—	—	—	—
1904	2	"	72	0 14½	21·31	18·45
1905	1	"	149	1 1¼	23·47	23·15
1906	2	"	33	1 13	22·4	29·10
1907	2	"	65	1 11½	21·06	29·7

TABLE III.—AVERAGE YIELD OF THE SHORTHORNS, LINCOLN REDS, JERSEYS, GUERNSEYS, AND RED POLLS AT DIFFERENT PERIODS.

Year	Breed	No. of Cows	Days in Milk, 50	No. of Cows	Days in Milk, 100	No. of Cows	Days in Milk, 135	No. of Cows	Days in Milk, 190
			lbs. ozs.		lbs. ozs.		lbs. ozs.		lbs. ozs.
1895 to									
1900	Shorthorns	19	1 12 $\frac{1}{2}$	6	1 7 $\frac{1}{2}$	2	1 4 $\frac{3}{8}$	8	1 1 $\frac{1}{2}$
1901	"	2	1 8	—	—	1	2 6	—	—
1902	"	6	1 10 $\frac{1}{2}$	—	—	1	1 11	—	—
1903	"	3	1 7	—	—	1	1 6 $\frac{1}{4}$	—	—
1904	"	3	1 10 $\frac{1}{8}$	1	1 14 $\frac{1}{2}$	—	—	—	—
1905	"	2	1 1	1	2 0 $\frac{1}{2}$	2	1 7 $\frac{3}{4}$	—	—
1906	"	11	1 8 $\frac{1}{2}$	3	1 3 $\frac{3}{4}$	—	—	—	—
1907	"	11	1 9 $\frac{1}{2}$	2	1 9 $\frac{3}{4}$	1	0 15 $\frac{3}{4}$	—	—
1907	Lincoln Reds	3	1 12	1	1 11	—	—	—	—
1895 to									
1900	Jerseys	23	1 10 $\frac{1}{4}$	15	1 8 $\frac{1}{2}$	11	1 8 $\frac{1}{8}$	31	1 10 $\frac{1}{4}$
1901	"	1	1 12	8	1 7 $\frac{3}{4}$	6	1 9	12	1 10 $\frac{1}{2}$
1902	"	4	1 9 $\frac{3}{4}$	3	1 8 $\frac{3}{8}$	2	1 14	9	1 11
1903	"	4	1 9 $\frac{1}{2}$	5	1 15	9	1 9 $\frac{3}{8}$	2	1 9 $\frac{3}{4}$
1904	"	2	1 10 $\frac{1}{8}$	3	2 2 $\frac{1}{2}$	4	2 0 $\frac{1}{2}$	1	1 13 $\frac{1}{2}$
1905	"	3	1 8 $\frac{1}{2}$	4	1 15 $\frac{1}{2}$	8	1 9 $\frac{1}{4}$	2	1 8 $\frac{1}{2}$
1906	"	5	1 10 $\frac{3}{4}$	3	1 3 $\frac{1}{2}$	4	1 15 $\frac{1}{2}$	1	1 5 $\frac{3}{8}$
1807	"	6	1 13 $\frac{1}{5}$	2	1 7 $\frac{7}{8}$	3	1 13	1	1 4 $\frac{1}{4}$
1895 to									
1900	Guernseys	3	1 7 $\frac{1}{2}$	4	1 7 $\frac{1}{2}$	3	1 4 $\frac{5}{8}$	1	1 8
1901	"	1	1 15 $\frac{1}{4}$	2	1 5 $\frac{3}{4}$	—	—	2	1 8 $\frac{5}{8}$
1902	"	—	—	—	—	—	—	—	—
1903	"	2	0 15 $\frac{1}{4}$	—	—	—	—	—	—
1904	"	2	1 6 $\frac{3}{4}$	—	—	1	2 0 $\frac{1}{2}$	—	—
1905	"	1	1 10 $\frac{1}{2}$	—	—	1	1 12 $\frac{1}{4}$	1	0 13 $\frac{1}{2}$
1906	"	—	—	1	1 1	1	1 5 $\frac{1}{4}$	—	—
1907	"	—	—	—	—	—	—	1	1 14
1895 to									
1900	Red Polls	10	1 4 $\frac{1}{2}$	2	1 8	2	0 12 $\frac{3}{4}$	1	0 11
1901	"	—	—	2	1 8 $\frac{5}{8}$	—	—	1	—
1902	"	—	—	3	1 8	—	—	—	1 2 $\frac{1}{4}$
1903	"	1	0 13 $\frac{3}{4}$	1	1 1 $\frac{1}{4}$	—	—	1	0 18
1904	"	1	1 13	2	1 1	1	1 7 $\frac{1}{4}$	—	—
1905	"	3	1 1	2	1 5	—	—	1	0 12
1906	"	7	1 0	—	—	2	0 14 $\frac{1}{2}$	—	—
1907	"	5	1 4	—	—	4	1 1 $\frac{1}{4}$	—	—

TABLE IV.—COMPARISON OF CHURNINGS WITH ANALYSES.
SHORTHORNS.

No in Catalogue	Weight of Butter Churned		Total Fat shown by Chemical Analysis		No in Catalogue	Weight of Butter Churned		Total Fat shown by Chemical Analysis	
	lbs.	ozs.	lbs.	ozs.		lbs.	ozs.	lbs.	ozs.
3	1	11 $\frac{1}{2}$	2	2	36	1	4 $\frac{1}{2}$	1	4 $\frac{3}{4}$
4	1	4 $\frac{1}{2}$	1	7 $\frac{1}{4}$	37	4	0 $\frac{1}{4}$	3	13 $\frac{3}{4}$
5	1	2 $\frac{1}{2}$	1	11	38	1	6	1	11 $\frac{1}{4}$
6	1	14 $\frac{1}{4}$	1	15 $\frac{1}{4}$	40	1	15	2	9 $\frac{1}{4}$
7	1	11 $\frac{3}{4}$	1	11	41	1	2 $\frac{1}{2}$	1	5 $\frac{1}{2}$
12	1	6 $\frac{1}{4}$	1	14 $\frac{3}{4}$	46	1	6 $\frac{1}{4}$	1	5 $\frac{1}{2}$
14	0	15 $\frac{3}{4}$	1	6	47	1	7 $\frac{1}{2}$	1	12
15	2	0 $\frac{3}{4}$	2	2	48	1	15	1	15 $\frac{1}{2}$
17	1	9 $\frac{1}{2}$	1	10 $\frac{1}{4}$	50	1	2	1	4 $\frac{3}{4}$
19	1	7 $\frac{1}{4}$	1	10 $\frac{3}{4}$	51	2	11 $\frac{1}{4}$	2	11 $\frac{1}{2}$
20	1	4 $\frac{1}{4}$	1	3 $\frac{1}{2}$	52	2	8 $\frac{1}{4}$	2	4
21	2	2 $\frac{1}{4}$	2	1	53	2	8 $\frac{3}{4}$	2	4 $\frac{3}{4}$
28	1	9 $\frac{3}{4}$	1	8 $\frac{1}{4}$					
34	1	6 $\frac{1}{2}$	1	4 $\frac{1}{2}$					
						45	2 $\frac{1}{4}$	47	12 $\frac{3}{4}$

LINCOLN RED SHORTHORNS.

54	1	11 $\frac{3}{4}$	1	9 $\frac{3}{4}$	58	1	10 $\frac{1}{2}$	1	11 $\frac{1}{4}$
55	1	13 $\frac{3}{4}$	1	10 $\frac{3}{4}$	59	2	8	2	3
56	2	1 $\frac{1}{2}$	1	15	60	1	6 $\frac{1}{2}$	1	9 $\frac{1}{2}$
57	1	11	1	9 $\frac{3}{4}$					
						12	15	12	5

JERSEYS.

84	1	11 $\frac{1}{4}$	1	9 $\frac{3}{4}$	104	1	10	1	7 $\frac{1}{4}$
85	2	9 $\frac{1}{4}$	2	5	109	1	13 $\frac{3}{4}$	1	11
92	2	4 $\frac{1}{2}$	2	4 $\frac{1}{2}$	112	1	11 $\frac{3}{4}$		—
95	2	0 $\frac{1}{4}$	1	12 $\frac{1}{4}$	120	1	5 $\frac{1}{2}$		—
96	1	12	1	10 $\frac{3}{4}$	121	1	5 $\frac{3}{4}$		—
97	1	7 $\frac{1}{4}$	1	5 $\frac{3}{4}$	143	1	10		—
99	1	4 $\frac{1}{4}$	1	5 $\frac{1}{4}$					
						22	10 $\frac{1}{4}$		

GUERNSEYS.

145	1	14	1	9 $\frac{1}{2}$	148	1	10 $\frac{3}{4}$	1	9 $\frac{3}{4}$
						3	8 $\frac{1}{4}$	3	3 $\frac{1}{4}$

RED POLLS.

150	1	6 $\frac{1}{2}$	1	6	156	1	9 $\frac{3}{4}$	1	12 $\frac{3}{4}$
151	1	0	1	3	157	1	2 $\frac{1}{2}$	1	10
152	1	9	1	10 $\frac{1}{2}$	161	0	13 $\frac{1}{4}$	1	15 $\frac{3}{4}$
153	1	2	1	6 $\frac{1}{4}$	165	0	14 $\frac{3}{4}$	1	0 $\frac{1}{4}$
154	1	6 $\frac{1}{4}$	1	9 $\frac{1}{4}$	163	0	14 $\frac{1}{4}$	1	3
155	0	15 $\frac{3}{4}$	1	4					
						12	8 $\frac{1}{2}$	16	1 $\frac{1}{4}$

KERRIES.

177	2	0 $\frac{1}{2}$	1	13 $\frac{3}{4}$	180	1	6	1	5 $\frac{1}{4}$
						3	6 $\frac{1}{2}$	3	3

TABLE V.—AVERAGE DIFFERENCES BETWEEN CHURNINGS AND CHEMICAL ANALYSES FROM 1898 TO 1907 INCLUSIVE.

Year	Breed	Churn	Analysis
		Lbs. Butter	Lbs. Fat
1898	Shorthorns	38.92	36.82
1899	"	34.34	32.46
1900	"	35.55	37.87
1901	"	29.05	27.80
1902	"	53.48	55.91
1903	"	30.72	35.92
1904	"	22.98	26.59
1905	"	30.89	30.58
1906	"	31.38	33.59
1907	"	45.14	47.79
1907	Lincoln Red Shorthorns	12.94	12.31
1898	Jerseys	29.15	27.26
1899	"	23.61	22.54
1900	"	39.75	39.32
1901	"	33.19	31.82
1902	"	43.61	41.03
1903	"	27.04	26.41
1904	"	22.22	22.06
1905	"	24.53	22.44
1906	"	19.56	18.71
1907	"	22.64	—
1898	Guernseys	8.07	8.25
1899	"	5.90	5.53
1900	"	10.84	11.10
1901	"	12.46	11.59
1902	"	1.23	1.34
1903	"	5.34	6.47
1904	"	4.89	4.94
1905	"	3.42	3.42
1906	"	2.41	1.82
1907	"	3.54	3.22
1898	Red Polls... ..	5.04	5.56
1899	"	8.48	8.33
1900	"	8.98	9.81
1901	"	3.07	2.88
1902	"	8.36	8.00
1903	"	5.01	6.95
1904	"	5.39	6.00
1905	"	13.42	14.53
1906	"	11.39	14.5
1907	"	12.53	16.08
1907	Kerries	3.4	3.19

APPLICATIONS FOR PATENTS FOR DAIRY APPLIANCES, &c.

From Jan. 1st to Dec. 31st, 1907.

No. of Application.	Name of Applicant.	Subject of Invention.
700	Rathbun, S. B., and another	Churn dashers.
1,523	Atkinson, T. N., and another	Churns, etc.
1,838	Separator, A.	Operating device for milking machines.
1,845	Separator, A.	Driving device for milking machines.
1,868	Breite, S.	Milking machines.
2,140	Stevenson, J.	Cream mould, separator, and cleaner.
2,299	Harcastle, F. E.	Milk churn ventilator plug.
2,326	Bond, F. T.	Preparation of cheese.
3,070	Harcastle, F. E.	Milk churn.
3,434	Palmer, E. H. G.	Milk can fastener.
3,442	Price, T.	Butter churns.
4,529	Anderson, S. P.	Churns.
4,689	Stevens, F. J.	Attachment to doors for preventing removal of milk cans.
6,101	Oliphant, W.	Milk churns.
6,394	Borgström, A. H.	Manufacture of butter.
6,489	Pritchard, G. A.	Milk cans.
7,500	Boult, A. J. (<i>American Farm Products Co.</i>)	Manufacture of butter.
8,422	Bredenkamp, J., and another	Desacidification and purification of old butter.
8,557	Barry, R.	Apparatus for testing milk.
8,708	Baltic-Separator, A.	Manufacture of butter.
8,756	Bell, S. and E.	Milk buckets, etc.
8,979	Beardsley, A.	Milk cans, etc.
9,015	Mitscherlich, S.	Manufacture of margarine.
9,082	Beardsley, A.	Cans and lids for milk.
9,512	Beardsley, A.	Milk cans, etc.
9,601	Vale, H. E.	Churns and churning.
9,772	Friday, S. B.	Butter-cutting machines.
10,362	Litche, G., and another	Preparing cow's milk for food for infants.
10,764	Pocock, S. J., and The Dairy Outfit Co. Ltd.	Milk cleaner or filter.
11,564	Winter, R.	Substitutes for butter.
12,095	Riegel, M.	Preparing jelk-emulsion to be used in the production of edible fats, butter substitutes, etc.
12,355	Sørensen, A. M.	Artificial butter-making.
12,561	Schou, H. H. and E.	Apparatus for making margarine.
13,865	Baker, A. W.	Outside gauge for milk churns in transit.
14,423	Pfeiff, A. T.	Cooling and ventilating milk, cream, etc.

APPLICATIONS FOR PATENTS FOR DAIRY APPLIANCES, &c.

From Jan. 1st to Dec. 31st, 1907.

No. of Application.	Name of Applicant.	Subject of Invention
15,222	Berglund, G. H.	Milking machines.
15,487	Easton, A. J., and another	Securing milk cans with alarm attached.
15,568	Taylor, E. Z.	Vessels for collection, storage, transport, and delivery of milk, etc.
15,821	Beardsley, A.	Watertight cans and lids for milk.
15,919	Hawley, J. G.	Milk sieve.
16,209	Hopkins, W.	Closing butter churns, milk churns, etc.
16,231	Struthers, J.	Vessels for receiving, conveying, and distributing milk.
16,930	Lawrence, W. H., and another (Burrell, L., U.S.A.)	Apparatus for actuating milking machines.
16,931	Lawrence, W. H., and another (Feldmeier, H., U.S.A.)	Apparatus for actuating milking machines.
17,285	Liversedge, A. J.	Butter and butter substitutes
17,290	Fisher, J. C.	Dust-proof milk pail and lid.
17,901	Eddy, J.	Wire cheese cutter.
17,953	Kathe, J.	Producing plastic masses from casein.
17,985	Raven, F.	Milking machines and connections.
18,499	Kolesch, P.	Process for rendering vegetable butter capable of being spread.
18,810	Priestner, W.	Closing milk cans.
18,909	Priestner, W.	Vents for milk cans.
19,315	Robinson, S.	Milk bowls.
19,435	Marshall, S., and Smith, J. S.	Milk cans.
19,777	Pritchard, G. A.	Milk cans.
20,035	Mackay, F. N.	Blending and washing butter.
20,167	O'Connell, D.	Delivery of milk.
20,189	Pemberton, B. T.	Churns.
20,279	Raphael, H. J. W.	Milk cans.
20,768	Barnett, M.	Cutting cheese.
20,983	Waide, R.	Securing the lids of churns.
21,177	Hodell, F. G.	Butter cutting machines.
21,865	Struthers, J.	Outfit used in the milking, cooling, conveyance, and distribution of milk.
21,912	Marti, J.	Process for preparing artificial butter.
22,076	Frost, A. E.	Straining and filtering milk.
22,150	Beardsley, A.	Milk cans.
22,534	Taylor, E. Z.	Vessels for delivery of milk to customers.
22,535		
22,536		
22,537		

APPLICATIONS FOR PATENTS FOR DAIRY APPLIANCES, &c.

From Jan. 1st to Dec. 31st, 1907.

No. of Application.	Name of Applicant.	Subject of Invention.
22,586	Berg, P. V. P.	Securing cow's tails during milking.
22,912	Sensicle, C. E.	Cow tail clip.
23,359	Hamilton, G. S.	Means for serving milk through a door.
23,380	Baloche, C. A.	Reception of milk.
23,600	Painton, K. J.	Milk can or churn.
24,375	Erfurt, Max	Emulsifying milk, etc.
24,516	Boult, A. J. (<i>MacLaren Cheese-cutting Co. Ltd., Canada</i>).	Cheese-cutting machines.
24,969	Smith, V. G.	Washing butter.
25,393	Mollinger, T. G., and another ..	Process and apparatus for keeping milk sound.
25,437	Richmond, E. W., and Lister & Co. Ltd.	Butter churns, milk cans, etc.
25,981	Senn, J. F.	Churns.
26,191	Boland, J.	Butter worker.
26,200	Richmond, W.	Testing the acidity of milk.
26,565	Childs, H.	Corrugated enamel dairy utensils.
28,024	Justice, P. M. (<i>Cooke, H., U.S.A.</i>)	Process of obtaining butter-fat.
28,254	Robertson, J. W.	Combined milk bowl, cover, and stirrer, to enable retailers to have milk equally mixed when serving customers.

British Dairy Farmers' Association.

EXAMINATION FOR DIPLOMA AND CERTIFICATES AT
THE BRITISH DAIRY INSTITUTE, READING, ON
WEDNESDAY, THURSDAY, AND FRIDAY, MAY 22ND,
23RD, AND 24TH, 1907.

EXAMINERS: MR. PRIMROSE MCCONNELL, MR. HENRY CANNON,
and MR. F. J. LLOYD, F.C.S.

Two hours are allotted to Candidates for Cheese-making, Butter-making, or Elementary Teachers' Certificates; and three hours to Candidates for Dairy Teachers' Certificates, or both Butter and Cheese Making Certificates.

The written part of the Examination for the Diploma will be divided into two parts: the first three hours being devoted to the 14 questions contained on this sheet. After an interval of an hour-and-a-half, Diploma Candidates will be allowed a further two hours to answer eight additional questions.

Candidates will also be examined *vice versa*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

Candidates are required to answer the following questions:—

FOR BUTTER-MAKING OR ELEMENTARY TEACHERS' CERTIFICATE	Nos. 1 to 8, inclusive.
FOR CHEESE-MAKING CERTIFICATE	Nos. 1 to 4 and 9 to 12, inclusive.
FOR DAIRY TEACHERS' CERTIFICATE OR DIPLOMA	Nos. 1 to 14, inclusive.
FOR DIPLOMA	Second paper (as above stated).

QUESTIONS.

1. What is the meaning of specific gravity? How do you estimate the specific gravity of milk? To what extent may it vary, and why?
2. What are the chief advantages gained by ripening cream?
3. In what respects would you expect the solids of dried milk to differ from those of whole milk and why?

4. Describe the preparation of a pure starter for butter making.
What organism or organisms do you wish to be present, and why ?
 5. What are the principal causes of sleepy cream ? If after churning one hour the butter did not come, what would you do ?
 6. When washing the butter grains in the churn, what objects have you in view ?
 7. Why is it desirable to preserve the grain in butter ?
 8. Make a calculation to show under what conditions it is possible for butter making to be profitable, starting with the quality and price of the milk you will use.
 9. In making Cheddar cheese what are the chief precautions necessary—
 - (a) When the milk is too acid ?
 - (b) When there is a want of acidity ?
 10. What are the chief causes of taints in milk, and ill flavours in cheese ? State a few.
 11. What is the object of obtaining sufficient acidity in the milk before renneting ; and what effect would a want of acidity have in the making of the cheese ?
 12. In making Cheddar cheese, say from a dairy of forty cows, how would you treat the evening's milk ? And would this influence the loss of butter fat in the whey ?
 13. State the general principles on which a separator acts, and show how these are applied in three or four of the latest makes of separator.
 14. Write an outline of a short lecture on bacteria suitable for elementary pupils attending a ten-day course of butter-making.
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SECOND PAPER FOR DIPLOMA CANDIDATES.

Two hours allowed.

QUESTIONS.

15. Given a supply of meadow hay, mangolds, and cotton cake : state the number of pounds daily of each you would allow to average Shorthorns in milk during the Winter time.
16. What is an "albuminoid ratio," and what approximately would be the same in the rations you give in your answer to the previous question ?
17. What are the important elements of fertility contained in the following manures :—Kainit, nitrate of soda, bones, basic slag, bone superphosphate ? Give approximately the percentage proportion of these useful ingredients.
18. Give a list of the grasses and clovers, and the quantities in pounds of each per acre, you would include in a mixture for a two years' ley, to be out for hay the first year, and fed with milk cows the second. Give your reasons for using the grasses you select.
19. Describe the modern treatment of milk-fever in a cow. What preventive treatment should farmers adopt ?
20. Describe the system you would adopt of keeping a milk record of a herd of cows so as to test the yield of each individual, as to quantity and quality of milk.

EXAMINATION FOR BUTTER-MAKING, CHEESE-MAKING,
AND DAIRY TEACHERS' CERTIFICATES AT THE
DAIRY DEPARTMENT, COUNTY LABORATORIES,
CHELMSFORD. ON MONDAY, TUESDAY, AND
WEDNESDAY, MAY 27TH, 28TH, AND 29TH, 1907.

EXAMINERS : MR. R. H. EVANS, B.Sc., and MR. F. J. LLOYD, F.C.S.

Three hours are allotted to Candidates for Dairy Teachers' Certificates, or both Butter and Cheese Making Certificates; and *two* hours to Candidates for either Cheese-making or Butter-making Certificates. Candidates will also be examined *viva voce*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

Candidates are required to answer the following questions:—

- FOR BUTTER-MAKING CERTIFICATE . . . Nos. 1 to 8, inclusive.
FOR CHEESE-MAKING CERTIFICATE . . . Nos. 1 to 4 and 9 to
12, inclusive.
FOR DAIRY TEACHERS' CERTIFICATE . . . Nos. 1 to 14 inclusive.

QUESTIONS.

1. What are the constituents present in milk, and to what use is each put in dairying ?
2. Does the quality of milk depend upon the quantity a cow yields ? Give reasons for your answer.
3. Explain the various ways by which the consistency of cream can be regulated during the process of separating.
4. What thickness of cream is best for butter-making, and why ?

5. What are the reasons for ripening cream for butter-making, and what the effects of under-ripening and over-ripening respectively ?
 6. Mention some of the important things you would aim at in preparing a starter for cream ripening ?
 7. Under what conditions would you expect to find a high percentage of fat in buttermilk, and what steps should be taken to avoid any excessive loss ?
 8. What faults in the making of butter can be detected by carefully examining the butter ? State how they are discovered.
 9. Describe the management of evening's milk intended for cheese-making the following day.
 10. Describe the operation of cutting curd. What precautions are necessary in performing the operation ?
 11. At what stages in the manufacture of cheese would you take acid tests, and what amount of acidity would you expect to find in each case.
 12. Mention some of the means adopted for controlling acidity in cheese-making.
 13. State the general principles on which a separator acts, and show how these are applied in three or four of the latest makes of separator.
 14. Write an outline of a short lecture on bacteria, suitable for elementary pupils attending a ten day course of butter-making.
-

EXAMINATION FOR DIPLOMA AND CERTIFICATES AT
THE BRITISH DAIRY INSTITUTE, READING, ON
THURSDAY, FRIDAY, AND SATURDAY, SEPTEMBER
5TH, 6TH, AND 7TH, 1907.

EXAMINERS : MR. DOUGLAS A. GILCHRIST, DR. THOS. MILBURN,
and MR. F. J. LLOYD, F.C.S.

Two hours are allotted to Candidates for Cheese-making, Butter-making, or Elementary Teachers' Certificates; and three hours to Candidates for Dairy Teachers' Certificates, or both Butter and Cheese Making Certificates.

The written part of the Examination for the Diploma will be divided into two parts; the first three hours being devoted to the 14 questions contained on this sheet. After an interval of an hour-and-a-half, Diploma Candidates will be allowed a further two hours to answer eight additional questions.

Candidates will also be examined *viva voce*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

Candidates are required to answer the following questions :—

FOR BUTTER-MAKING OR ELEMENTARY

TEACHERS' CERTIFICATE Nos. 1 to 8, inclusive.

FOR CHEESE-MAKING CERTIFICATE Nos. 1 to 4 and 9 to
12, inclusive.

FOR DAIRY TEACHERS' CERTIFICATE OR

DIPLOMA Nos. 1 to 14, inclusive.

QUESTIONS.

1. What constituents does milk contain? How can you prove that they are present?
2. How would you sample and test for butter fat the milk of a small herd of dairy cows?
3. Compare the characteristics of the cream and skim milk obtained from a separator with those obtained by means of shallow pans.

4. What is the object of ripening cream, and why are the desired results obtained ?
5. How would you decide at what temperature you would churn cream given to you to make into butter ?
6. Should the butter grains in the churn be the same size before and after washing ? Give full reasons for your answer.
7. How much casein would good butter contain ? Would more than this always prove injurious ?
8. What are the effects visible in the butter—
 - (a) of not using the butter-worker long enough ?
 - (b) of using it for too long ?
 - (c) of turning the handle too fast ?
9. State how you would manage the milk in making a Cheddar cheese from the commencement of milking the previous evening till the renneting next morning.
10. How does the cutting of curd influence future operations in the making of cheese ?
11. A well-made Stilton cheese becomes blue when ripe ; not so a Cheddar. What are the essential differences in the process of making which produce these results—and why ?
12. Write a short account of rennet and its properties.
13. Describe the thermometer and its use in the process of butter-making as you would to a class of elementary pupils.
14. If you had reason to suspect that the milk from a particular dairy farm was tainted, what experiments would you carry out to ascertain the cause ?

SECOND PAPER FOR DIPLOMA CANDIDATES.

Two hours allowed.

QUESTIONS.

15. What are the most important breeds of milking cattle in this country? Give the leading characteristics of the three breeds you are best acquainted with.
16. What is Tuberculosis? State the symptoms and how it can be discovered; what precautions might be taken by dairy farmers to diminish this disease.
17. Give the average composition of cotton and decorticated cotton cakes, and write a short account of their feeding and manurial values.
18. State the general conditions necessary for the *economic* production of butter and cheese.
19. Name the district, and state briefly the system of dairying on any farm you know. What green and root crops would you prefer to grow there for milch cows? State the reason for your choice of these crops, and the period of the year at which each would be fed to the cows.
20. Describe how and when you would make an annual valuation of the stock of the above farm, and give a list of the items you would include in the valuation.

AWARD OF PRIZES, DAIRY SHOW, 1907.

COWS AND HEIFERS IN MILK.

- Class 1—SHORTHORN COWS.**—Entered in or eligible for Coates' Herd Book, or its pedigree sent for such entry previous to the Show.—*First Inspection Prize* (£10) to Lord Rothschild, Tring Park, Herts, for "Red Rose 3rd." *Second Inspection Prize* (£5), Half of Shorthorn Society's Prize of £10, and Half of *Second Milking Trial Prize* of £10 to Geo. B. Nelson, Cockerham Hall, near Garstang, for "Comely Maid." *Third Inspection Prize* (£3), *First Milking Trial Prize* (£15), and Half of Shorthorn Society's Prize of £10, to George Taylor, Cranford, Hounslow, for "Melody." *Fourth Inspection Prize* (£1) to Lord Rothschild for "Dorothy." Half of *Second Milking Trial Prize* of £10 to Wm. Nisbet, Lordship, Hinxton, Saffron Walden, for "Red Millicent III." *Third Milking Trial Prize* (£5) divided between Geo. B. Nelson's "Comely Maid" and Wm. Nisbet's "Red Millicent III."
- Class 2—SHORTHORN COWS.**—Not eligible for Class 1.—*First Inspection Prize* (£10) to Sam S. Raingill, The Grange, Ringway, Altrincham, for "Witch." *Second Inspection Prize* (£5) to Alfred J. Hollington, Great Hayes, Stow Maries, Maldon, for "White Heather." *Third Inspection Prize* (£3), The Lord Mayor's Champion Cup, The Barham Challenge Cup, The Spencer Challenge Cup, and the *First Milking Trial Prize* (£15), to Geo. B. Nelson, Cockerham Hall, near Garstang, for "Daisy." *Fourth Inspection Prize* (£2) and *Second Milking Trial Prize* (£10) to R. & E. Brown, Moor End Farm, Harrogate Road, Ripon, Yorks., for "Perfection." *Third Milking Trial Prize* (£5) to John Wilson, Blencoe House, Wigton, for a Roan (No. 51).
- Class 3—LINCOLNSHIRE RED SHORTHORN COWS.**—Entered in or eligible for the Herd Book of the Lincolnshire Red Shorthorn Association.—*First Inspection Prize* (£10) to John Evens, Burton, Lincoln, for "Burton Ruby Spot 2nd." *Second Inspection Prize* (£5) to John Evens, for "Burton Nancy III." *First Milking Trial Prize* (£15) and Lord Mayor's Champion Cup to John Evens for "Burton Nancy IV." *Second Milking Trial Prize* (£10) to Fred Scorer, Nettleham Lodge, Lincoln, for "Bracebridge No. 3B."
- Class 4—SHORTHORN HEIFERS, not exceeding three years.**—Entered in or eligible for Coates' Herd Book.—*First Inspection Prize* (£5) to J. T. Hobbs, Maisey Hampton, Fairford, Glos. *Second Inspection Prize* (£3) and *Second Milking Trial Prize* (£4) to Lord Rothschild, Tring Park, Herts, for "Aster." *Third Inspection Prize* (£2) to W. M. Cazalet, Fairlawn, Tonbridge, for "Babraham Wild Eyebright." *Fourth Inspection Prize* (£1) and *First Milking Trial Prize* (£7) to Wm. Nisbet, Lordship, Hinxton, Saffron Walden, for "Bendyshe Queen." *Third Milking Trial Prize* (£2) to C. R. W. Adeane, Babraham Hall, Cambridge, for "Babraham Treasure."
- Class 5—SHORTHORN HEIFERS, not exceeding three years.**—Not eligible for Class 4.—*First Inspection Prize* (£5) to John Evens, Burton, Lincoln, for "Burton C. Star VII." *Second Inspection Prize* (£3) and *First Milking Trial Prize* (£7) to Geo. B. Nelson, Cockerham Hall, near Garstang, for "Polly." *Third Inspection Prize* (£2) and *Third Milking Trial Prize* (£2) to J. L. Shirley, Bletchley, for "Maisie." *Fourth Inspection Prize* (£1) and *Second Milking Trial Prize* (£4) to Wm. Nisbet, Lordship, Hinxton, Saffron Walden, for "Jessie."

Class 6—JERSEY COWS.—Entered in or eligible for the Herd Book.—*First* Inspection Prize (£7) to R. Bruce Ward, Westwood, Droitwich, for "Mrs. Viola." *Second* Inspection Prize (£4) to J. H. Smith-Barry, Stowell Park, Pewsey, Wilts, for "Unaware." *Third* Inspection Prize (£2) and The Blythwood Challenge Bowl to Lady de Rothschild, Aston Clinton, Bucks, for "Whitewood IV." *First* Milking Trial Prize (£15) to J. H. Smith-Barry, for "Post Obit." *Second* Milking Trial Prize (£10) to Mrs. E. M. Watson-Kennedy, Wiveton Hall, Cley, Norfolk, for "Majorca." *Third* Milking Trial Prize (£5) to R. Bruce Ward, Westwood, Droitwich, for "Lovely Venus."

Class 7—JERSEY HEIFERS, not exceeding three years.—Bred in Great Britain or Ireland.—Entered in or eligible for the Herd Book.—*First* Prize (£7) to J. H. Smith-Barry, Stowell Park, Pewsey, for "Marionette." *Second* Prize (£4) to Henry P. Smith, North Hall, Wrentham, Suffolk, for "Sea Swallow." *Third* Prize (£2) to Lady de Rothschild, Aston Clinton, Bucks, for "Waterhen."

Class 8—JERSEY HEIFERS, not exceeding three years.—Bred in the Channel Islands.—Entered in or eligible for the Jersey or English Jersey Herd Book.—*First* Prize (£7) to Lord Rothschild, Tring Park, Herts, for "Palm Sunday." *Second* Prize (£4) to John Pallot, Mont Pellier Farm, Trinity, Jersey, for "Little Beauty." *Third* Prize (£2) to Jersey de Knoop, Calveley Hall, Tarporley, Cheshire, for "Miss Sellon."

Class 9—GUERNSEY COWS.—Entered in or eligible for the Herd Book.—*First* Inspection Prize (£7) and *First* Milking Trial Prize (£15) to E. A. Hambro, Hayes Place, Hayes, Kent, for "Queen of the Roses." *Second* Inspection Prize (£4) to E. A. Hambro for "Hayes Express." *Second* Milking Trial Prize (£10) to Sir Henry F. Lennard, Bart., Wickham Court, West Wickham, Kent, for "Lady-88."

Class 10—(Cancelled).

Class 11—RED POLLED COWS.—Entered in or eligible for the Herd Book.—*First* Inspection Prize (£7) to Lord Rothschild, Tring Park, Herts, for "Atalanta." *Second* Inspection Prize (£4) to Lord Rothschild for "Clarissa." *Third* Inspection Prize (£2) and *Third* Milking Trial Prize (£5) to Sir Walter Corbet, Bart., Acton Reynold, Shrewsbury, for "Desiree of Johnstown." *First* Milking Trial Prize (£15) to the Earl of Radnor, Longford Castle, Salisbury, for "Mona." *Second* Milking Trial Prize (£10) to Lord Rothschild for "Ethel 3rd."

Class 12—RED POLLED HEIFERS, not exceeding three years.—Entered in or eligible for the Herd Book.—*First* Inspection Prize (£5) and *First* Milking Trial Prize (£5) to Kenneth M. Clark, Sudbourne Hall, Orford, for "Sudbourne Princess." *Second* Inspection Prize (£3) and *Second* Milking Trial Prize (£3) to A. Carlyle Smith, Ashmoor, Campea Ashe, for "Queen Mab." *Third* Inspection Prize (£2) to Lord Rothschild, Tring Park, Herts, for "Heroine." *Third* Milking Trial Prize (£2) to Kenneth M. Clark, for "Sudbourne Lute I."

Class 13—AYRSHIRE COWS.—*First* Prize (£7) to John Littleton, Arkleby Hall Farm, Aspatria, via Carlisle, for "Sally."

Class 14—(Cancelled).

Class 15—KERRY COWS.—Entered in or eligible for the Herd Book.—*First* Inspection Prize (£7) and *First* Milking Trial Prize (a Cup value £5) to The Countess de la Warr, Old Lodge, Ashdown Forest, Nutley, Sussex, for "Buckhurst Gem." *Second* Inspection Prize (£4) and *Second* Milking Trial Prize (£3) to Lady Greenall, Walton Hall, Warrington, for "Joyous." *Third* Inspection Prize (£2) to Countess de la Warr for "Buckhurst Peaceful." *Third* Milking Trial Prize (£2) to Countess de la Warr for "Buckhurst Waterville."

Class 16—DEXTER COWS.—Entered in or eligible for the Herd Book.—*First* Inspection Prize (£7) and *Second* Milking Trial Prize (£2) to Hon. Mrs. Claud Portman, Goldicote, Stratford-on-Avon, for "Buckhurst Juno." *Second* Inspection Prize (£4) and *First* Milking Trial Prize (£3) to The Duchess of Devonshire, Compton Place, Eastbourne, for "Compton Dark Beauty." *Third* Inspection Prize (£2) to the Duchess of Devonshire for "Compton Doola."

Class 17—PAIR OF COWS OF ANY BREED OR CROSS (in Milk).—*First* Prize (£15) to Sam S. Raingill, The Grange, Ringway, Altrincham, for "Faithful" and "Pansy;" (Shorthorns). *Second* Prize (£10) to George B. Nelson, Cockerham Hall, near Garstang, for "Dot" and "Daisy" (Shorthorns). *Third* Prize (£7) to John Evens, Burton, Lincoln, for "Burton Coa Fox IV." and "Violet VI." (Lincolnshire Red Shorthorns). *Fourth* Prize (£5) to R. E. Birch, Bryneuryn, Colwyn Bay, for "Llandrill's Lady" and "Bryneuryn Beauty" (Shorthorns). *Fifth* Prize (£3) to John Littleton, Arkleby Hall Farm, Aspatria, for "Molly" (Cross-bred) and "Ruth" (Shorthorn).

Class 18—SINGLE COW OF ANY BREED OR CROSS (in Milk).—*First* Prize (£5) to J. L. Shirley, Bletchley, for "Minnie" (Shorthorn). *Second* Prize (£4) to John Evens, Burton, Lincoln, for "Burton Dolly II." (Lincolnshire Red Shorthorn). *Third* Prize (£3) to Geo. B. Nelson, Cockerham Hall, near Garstang, Lancs., for "Buttercup" (Shorthorn).

BUTTER TESTS.

SHORTHORNS.—Entered in Classes 1, 2, 4, and 5.—*First* Prize (£5 and Silver Medal) to Geo. B. Nelson, Cockerham Hall, near Garstang, for "Daisy." *Second* Prize (£2 and Bronze Medal) to John Wilson, Blencoe House, Wigton, for a Roan (No. 51).

JERSEYS.—Entered in Classes 6, 7, and 8, and eligible for the English Jersey Herd Book.—*First* Prize (Gold Medal or £10) and Butter Prize (£1) to J. H. Smith-Barry, Stowell Park, Pewsey, Wilts, for "Post Obit." *Second* Prize (Silver Medal and £5) to Mrs. E. M. Watson Kennedy, Wiveton Hall, Cley, Norfolk, for "Majorca." *Third* Prize (Bronze Medal and £3) to Oswald F. Mosley, Old Club Dairy, Melton Mowbray, for "Loulah 3rd." The prizes in this Section were given by the English Jersey Cattle Society.

ANY OTHER BREED.—Entered in Class 3, or Classes 9 to 16 inclusive.—Prize (£3) to John Evens, Burton, near Lincoln, for "Burton Nancy IV." Prize (£3) to Sir Walter Corbet, Bart., Acton Reynold, Shrewsbury, for "Desiree of Johnstown." Prize (£3) to Countess de la Warr, Old Lodge, Ashdown Forest, Nutley, Sussex, for "Buckhurst Waterville Sapphire." Prize (£1) to Miss K. Carleton, Gifford Castle, Co. Down, for "Burton Young Cherry."

BULLS.

Class 19—SHORTHORN BULL, twelve months old or over.—Entered in or eligible for the Herd Book.—*First* Prize (£10) to Lord Rothschild, Tring Park, Herts, for "Traveller." *Second* Prize (£5) to J. T. Hobbs, Maiseyhampton, Fairford, Glos., for "Royal Pluto." *Third* Prize (£3) to A. B. and W. G. Little, Paxcroft Farm, Trowbridge, for "Victory 3rd."

Class 20—JERSEY BULL, above one year and not exceeding three years.—Entered in or eligible for the Herd Book.—*First* Prize (£10) to A. Miller-Hallett, Goddington, Chelsfield, Kent, for "Alfriston's Pride." *Second* Prize (£5) to Lady de Rothschild, Aston Clinton, Bucks, for "Stormer." *Third* Prize (£3) to W. M. Cazalet, Fairlawn, Tonbridge, for "Oatland's Glory."

Class 21—BULL OF ANY OTHER PURE BREED.—Entered in or eligible for the Herd Book.—Silver Medal to John Evens, Burton, near Lincoln, for "Burton Hermit II."

BREEDERS' PRIZES.

Silver Medal to the Breeder of each First Prize Cow, Heifer, or Bull in the Show.—William Bateman, for "Red Rose 3rd," No. 12; John Evens, for "Burton Ruby Spot 2nd," No. 60; J. T. Hobbs, for "Matchless 69th," No. 69; John Evens, for "Burton C. Star VII," No. 75; J. Dolbel, for "Mrs. Viola," No. 95; J. H. Smith-Barry, for "Marionette," No. 112; J. le Gresley, for "Palm Sunday," No. 130; H. Ozanne, for "Queen of the Roses," No. 146; J. E. Platt, for "Atalanta," No. 150; Kenneth M. Clark, for "Sudbourne Princess," No. 168; W. H. Mullens, for "Buckhurst Gem," No. 175; Countess de la Warr, for "Buckhurst Juno," No. 191; J. L. Shirley, for "Minnie," No. 214; Geo. B. Nelson, for "Daisy," No. 37; Lord Rothschild, for "Traveller," No. 226; Alexander Miller-Hallett, for "Alfriston's Pride," No. 229; John Evens, for "Burton Hermit II.," No. 237; George Taylor, for "Melody," No. 15; W. H. Rowlands, for "Burton Nancy IV.," No. 59; Wm. Nisbet, for "Bendyshe Queen," No. 68; Mr. Hall, for "Polly," No. 78; J. H. Smith-Barry, for "Post Obit," No. 92; The Earl of Radnor, for "Mona," No. 157; Kenneth M. Clark, for "Sudbourne Princess," No. 168.

SHE-GOATS.

Class 22—MILKING CLASS FOR GOATS (any variety).—*First Prize* (Silver Medal and £2 10s.) and the Baroness Burdett-Countts' Challenge Cup to Mrs. Handley Spicer, The Glen, Kingsbury, for "Sedgemere Capella." *Second Prize* (£1 10s.) to Sam Woodiwiss, Graveleys, Great Waltham, for "Sedgemere Faith." *Third Prize* (£1) to B. Ravenscroft, The Noke, St. Albans, for "Sedgemere Louise."

Class 23—GOATS OF ANY VARIETY that have won one or more First Prizes in Classes other than for Kids or Goatlings on or before September 9th, 1907.—*First Prize* (£2) and the British Goat Society's Challenge Cup to Sam Woodiwiss, Graveleys, Great Waltham, for "Sedgemere Faith."

Class 24—TÖGGENBURG OR OTHER SWISS OR ALPINE PURE BREEDS.—Not eligible for Class 23; over two years on October 1st, 1907.—*First Prize* (£2) to Sam Woodiwiss, Graveleys, Great Waltham, for "Folette." *Second Prize* (£1) to Mrs. Handley Spicer, The Glen, Kingsbury, for "Sedgemere Capella."

Class 25—HORNED SHE-GOATS.—Not eligible for Class 23 or 24; over two years on October 1st, 1907.—*First Prize* (£2) to B. Ravenscroft, The Noke, St. Albans, for "Bricket Louise." *Second Prize* (£1) to B. Ravenscroft, for "Sedgemere Louise." *Third Prize* (10s.) to H. E. Hughes, The Bungalow, Broxbourne, Herts, for "Blond."

Class 26—HORNLESS SHE-GOATS.—Not eligible for Class 23 or 24; over two years on October 1st, 1907.—*First Prize* (£2) to B. Ravenscroft, The Noke, St. Albans, for "Bricket Tatters." *Second Prize* (£1) to A. C. McMin, Western House, Kensal Green, for "Honeysuckle." *Third Prize* (10s.) to H. E. Hughes, The Bungalow, Broxbourne, for "Broxbourne Venus."

Class 27—GOATLINGS (any variety), over twelve months and not over two years on October 1st, 1907.—*First Prize* (£2) to B. Ravenscroft, The Noke, St. Albans, for "Bricket Eva." *Second Prize* (£1) to Sam Woodiwiss, Graveleys, Great Waltham, for "Sedgemere Cravate." *Third Prize* (10s.) to B. Ravenscroft, for "Bricket Bimp."

Class 28—FEMALE KIDS (any variety), not exceeding twelve months of age on October 1st, 1906.—*First Prize* (£2) to B. Ravenscroft, The Noke, St.

The Glen, Kingsbury, for "Copthorne Orange." *Third Prize* (10s.) to A. C. McMinn, Western House, Kensal Green, for "Princess Flo."

CHEESE (FOR MAKERS ONLY, RESIDING IN ANY PART OF THE UNITED KINGDOM).

- Class 29—CHEDDAR (4 Cheeses).—*First Prize* (£10) to T. C. Candy, Woolcombe, Cattistock, Dorset. *Second Prize* (£7) to Robert Stevenson, Boghead, Galston, Ayrshire. *Third Prize* (£5) to Albert White, West Lambrook, South Petherton, Somerset. *Fourth Prize* (£3) to Alexander Cross, Knockdon, Maybole, Ayrshire. *Fifth Prize* (£2) to Carey & Portch, Redlynch Park Farm, Bruton.
- Class 30—CHEDDAR TRUCKLES (8 Cheeses).—*First Prize* (£3) to Joseph Candy, Temple House, Doultling, Shepton Mallet. *Second Prize* (£2) to Robert Stevenson, Boghead, Galston, Ayrshire. *Third Prize* (£1) to Herbert Pickford, Westlands Farm, Melksham.
- Class 31—STILTON (8 Cheeses).—*First Prize* (£10) and the Lord Mayor's Champion Cup to J. C. Wilford, Old Manor House Dairy, Long Clawson, Melton Mowbray. *Second Prize* (£5) to Tuxford & Nephews, Melton Mowbray. *Third Prize* (£2) to Mrs. C. Fairbrother, Beeley, Leicester.
- Class 32—WENSLEYDALE (Stilton-shaped or Flat, 8 Cheeses).—*First Prize* (£5) to Anthony Harker, Carperby, S.O., Yorks. *Second Prize* (£3) to Mrs. Stubbs, Swinithwaite, Leyburn, S.O. *Third Prize* (£2) to William Mason, Swinithwaite, Leyburn, S.O.
- Class 33—CHESHIRE (4 Coloured Cheeses, no less than 40 lbs. each).—*First Prize* (£10) to W. H. Hobson, Gousley Hall, Blackenhall, Nantwich. *Second Prize* (£5) to John Dutton, Swanley Hall, Nantwich. *Third Prize* (£2) to Stephen Dickin, Hugmore House, Wrexham.
- Class 34—CHESHIRE (4 Uncoloured Cheeses, not less than 40 lbs. each).—*First Prize* (£10) to S. Lea, Kinsall, Oswestry. *Second Prize* (£5) to Peter Dutton, Hoofield Hall, Huxley, Chester. *Third Prize* (£2) to Charles Price, Ouston, Ellesmere, Salop.
- Class 35—LANCASHIRE (4 Cheeses).—*First Prize* (£5) to Lawrence Bailey, Bryars Farm, Lea, Preston. *Second Prize* (£3) to John Bee, Bulsnape Hall, Goosnargh, near Preston.
- Class 36—DOUBLE GLOSTER (4 Cheeses, from 26 lbs. to 30 lbs. each, total weight not to exceed 120 lbs.).—*First Prize* (£5) to the Swebston Dairy Co., Swebston, Ashby-de-la-Zouch, Leicestershire. *Second Prize* (£3) to Robt. H. White, Thorne, Sparkford, Somerset. *Third Prize* (£2) to J. Sage, Batcombe, Evererech.
- Class 37—SINGLE GLOSTER (4 Cheeses, from 13 lbs. to 15 lbs. each, total weight not to exceed 60 lbs.).—*First Prize* (£3) to George Prout, Standish Court, Stonehouse, Glos.
- Class 38—LEICESTER (4 Cheeses).—*First Prize* (£3) to Ernest Ball, Claybrooke, Rugby. *Second Prize* (£2) to Swebston Dairy Co., Swebston, Ashby-de-la-Zouch. *Third Prize* (£1) to John Platt, Wem, Salop.
- Class 39—DERBY (4 Uncoloured Cheeses, not less than 25 lbs. each).—*First Prize* (£3) to G. W. Lewis, Parwich Creamery, Parwich, Ashbourne. *Second Prize* (£2) to C. A. Goodwin, Aston Hill Farm, near Stone, Staffs.
- Class 40—CAERPHILLY (4 Cheeses, not exceeding 8 lbs. each).—*First Prize* (£3) to C. Harris & Son, Rectory Farm, Slimbridge, Stonehouse, Glos. *Second Prize* (£2) to Wilts United Dairies, Ltd., Devizes, Wilts. *Third Prize* (£1) to Wilts United Dairies.
- Class 41—CREAM CHEESE (made from pure Cream only; no milk or curd to be added; 6 Cheeses).—*Two Equal First Prizes* (£1 each) respectively to Wensleydale Pure Milk Society, Ltd., The Dairy, Northallerton, and The

Lady de Rothschild, Aston Clinton, Bucks. *Two Equal Second Prizes* (10s. each) respectively to F. W. Gilbert, Burnaston Dairy, Utttoxeter Road, Derby, and C. & G. Prideaux, Stalbridge, Dorset.

Class 42—GERVAIS (6 Cheeses).—*First Prize* (£1) to Wilts United Dairies, Ltd., Devizes, Wilts. *Second Prize* (10s.) to Wilts United Dairies, Ltd.

Class 43—UNRIPENED SOFT CHEESE (other than Cream Cheese or Gervais, made direct from milk; 4 Cheeses).—*First Prize* (£1) to Miss J. Watt-White, Wolves & Joyes' Farm, Noak Hill, Romford. *Second Prize* (10s.) to Miss J. Watt-White.

Class 44—RIPENED SOFT CHEESE (other than Cream Cheese or Gervais, made direct from milk; 4 Cheeses).—*First Prize* (£1) to Miss H. J. M. Taylor, British Dairy Institute, Reading. *Second Prize* (10s.) to Miss Elsie G. Cook, Ashford Farm, Ashford, Middlesex.

CHEESE FAIR.

(FOR MAKERS ONLY RESIDING IN ANY PART OF THE UNITED KINGDOM.)

Class 45—CHEDDAR (20 Cheeses).—*First Prize* (Silver Medal and £10) to Carey & Portch, Redlynch Park Farm, Bruton. *Second Prize* (£7) to Carey & Portch. *Third Prize* (£5) to Alexander Cross, Knockdon Maybole, Ayrshire. *Fourth Prize* (£3) to Robert Stevenson, Boghead, Galston, Ayrshire. *Fifth Prize* (£2) to James Whyte, Kirkmabreck, Sandhead, Stranraer.

Class 46—STILTON (36 Cheeses).—*First Prize* (Silver Medal and £8) to Henry Morris, Manor Farm, Saxelbye, Melton Mowbray. *Second Prize* (£4) to Scalford Dairy, Ltd., Scalford, Melton Mowbray.

COLLECTIONS OF DAIRY PRODUCE.

Class 47—COLLECTION OF BRITISH DAIRY PRODUCE.—*First Prize* (Gold Medal) to Aplin & Barrett and the Western Counties Creameries, Ltd., Yeovil.

Class 48—COLLECTION OF COLONIAL DAIRY PRODUCE.—No Entry.

BACON.

Class 49—SMOKED (four sides with or without the Hams attached).—*First Prize* (Silver Medal) to Hillier's Bacon Curing Co., Ltd., Newmarket, near Stroud. *Second Prize* (Bronze Medal) to Ernest E. Pigott, Bacon Curer, Oxford.

Class 50—UNSMOKED (four sides with or without the Hams attached).—*Second Prize* (Bronze Medal) to Joseph Smith, Cummersdale, near Carlisle.

HAMS.

Class 51—SMOKED (four Hams).—*First Prize* (Silver Medal) to J. Wright & Co., Taunton, Somerset. *Second Prize* (Bronze Medal) to Palethorpes, Ltd., Dudley Port, Staffs.

Class 52—UNSMOKED (under 14 lbs.; four Hams).—*First Prize* (Silver Medal) to Palethorpes, Ltd., Dudley Port, Staffs. *Second Prize* (Bronze Medal) to Palethorpes, Ltd.

Class 53—UNSMOKED (over 14 lbs.; four Hams).—*First Prize* (Silver Medal) to Palethorpes, Ltd., Dudley Port, Staffs. *Second Prize* (Bronze Medal) to Joseph Smith, Cummersdale, near Carlisle.

Class 54—SELLING CLASS FOR HAMS, ANY VARIETY (two Hams).—*First Prize* (£2) to Joseph Smith, Cummersdale, near Carlisle. *Second Prize* (£1) to Walter Mitchell & Sons, Ayr N R

BUTTER.

Class 55—**BUTTER** (perfectly free from salt, the produce of Channel Islands Cattle and their Crosses; 2 lbs. in 1 lb. lumps).—Three *Equal First Prizes* (£3 each) to Mrs. A. A. Bere, Emmerford Cove, Tiverton; Miss E. Masson, the Dairy Cottage, Floors Castle, Kelso, N.B.; Lord Portman, Bryanston, Blandford. Three *Equal Second Prizes* (£2 each) to Arthur F. Somerville, Wells, Somerset; Mrs. C. McIntosh, Bown Farm, Havering Park, Romford; Mrs. L. R. Mildon, Higher Mead Down, Rackenford, Morchard Bishop, Devon. Three *Equal Third Prizes* (£1 each) to Mrs. Evelyn, Wotton House, Dorking, Surrey; Lady de Rothschild, Aston Clinton, Tring; Mrs. M. Custance, Southwater, near Horsham.

Class 56—**BUTTER** (slightly salted, the produce of Channel Islands Cattle and their Crosses; 2 lbs. in 1 lb. lumps).—Three *Equal First Prizes* (£3 each) to A. S. Hay, Sacombe Park, Ware, Herts; Mrs. F. Reed, Wickham Court, West Wickham, Kent; Miss M. K. Harris, Brownsell Farm, Stourton Caundle, Stalbridge, Dorset. Three *Equal Second Prizes* (£2 each) to J. de Knoop, Calveley Hall, Tarporley; The Hon. A. Hoiland Hibbert, Munden, Watford; Lady de Rothschild, Aston Clinton, Bucks. Three *Equal Third Prizes* (£1 each) to Mrs. A. A. Bere, Emmerford Cove, Tiverton; Alfred Palmer, Wokefield Park, Mortimer, Berks; A. Miller-Hallett, Home Farm, Goddington, Chelsfield, Kent.

Class 57—**BUTTER** (perfectly free from salt, the produce of Shorthorn and other Cattle and their Crosses, except Channel Islands and their Crosses; 2 lbs. in 1 lb. lumps).—Three *Equal First Prizes* (£3 each) to Mrs. Emily Lewis, Pontantwm Farm, Llangendeirn, Kidwelly, Carmarthen; Mrs. L. R. Mildon, Higher Mead Down, Rackenford, Morchard Bishop, Devon; Mrs. George Adlam, Bubmith Farm, Wookey Hole, Wells, Somerset. Three *Equal Second Prizes* (£2 each) to Mrs. A. A. Bere, Emmerford Cove, Tiverton; Mrs. T. Down-Weeks, Goat Hall, Galleywood, Chelmsford; Miss A. Andrews, Hall Torrs, Yealmpton, Plymouth. Three *Equal Third Prizes* (£1 each) to John Harrison, Anchor Farm, Blubberhouse, Otley; Miss S. A. Cliffe, Egmonton, Tuxford, Notts; Miss Winnie Langdon Broadmead, Stordleigh, near Tiverton, Devon.

Class 58—**BUTTER** (slightly salted, the produce of Shorthorn and other Cattle and their Crosses, except Channel Islands and their Crosses; 2 lbs. in 1 lb. lumps).—Three *Equal First Prizes* (£3 each) to Miss Mary Dalrymple, Elliston, St. Boswells, N.B.; Lord Portman, Bryanston, Blandford; Mrs. George Adlam, Bubmith Farm, Wookey Hole, Wells, Somerset. Three *Equal Second Prizes* (£2 each) to Mrs. S. A. Keirley, Hole House Farm, Cliviger, near Burnley; Mrs. Pickup, Skelton, near York; Miss M. K. Harris, Brownsell Farm, Stourton Caundle, Stalbridge, Dorset. Three *Equal Third Prizes* (£1 each) to Mrs. H. Pendlebury, Brook Fold Farm, Harwood, near Bolton, Lancs.; William Rennie, Parkhead, Slamannan, Stirlingshire; Miss Winnie Langdon, Broadmead, Stordleigh, near Tiverton, Devon.

Class 59—**BUTTER** (slightly salted; 2 lbs. in 1 lb. lumps).—*First Prize* (£3) to F. Ricardo, The Friary, Old Windsor. *Second Prize* (£2) to Mrs. Frank Ward, Burnville, Brentor, Tavistock. *Third Prize* (£1) to J. de Knoop, Calveley Hall, Tarporley.

Class 60—**BUTTER** (free from salt, or slightly salted, at the discretion of the Exhibitor; to be made from Scalded Cream only; 2 lbs. in 1 lb. lumps).—*First Prize* (£3) to A. C. de Rothschild, C.V.O., Halton House, Halton, Tring. *Second Prize* (£2) to Mrs. A. A. Bere, Emmerford Cove, Tiverton. *Third Prize* (£1) to Lord Rothschild, Tring Park, Herts.

Class 61—**FRESH BUTTER** (free from salt; in 24 lb. boxes of 12 rolls. Packages (non-returnable) to be taken into consideration. The rolls not to be separately wrapped).—*First Prize* (£5) to Charles Frideaux, The Creamery,

Motcombe, Dorset. *Second Prize* (£3) to Coagh Co-operative Agricultural and Dairy Society, Ltd., Coagh, Co. Tyrone. *Third Prize* (£2) to Leekpatrick Co-operative Agricultural and Dairy Society, Ltd., Artigarvan, Strabane. *Fourth Prize* (£1) to Glenwilliam Co-operative Dairy Society, Ballingarry, Co. Limerick. *Fifth Prize* (10s.) to Killeshandra Co-operative Dairy and Agricultural Society, Ltd., Killeshandra, Co. Cavan.

Class 62—MILD CURED BUTTER (in boxes of 24 rolls of 1 lb. each, slightly salted. Packages (non-returnable) to be taken into consideration. Wrapping allowed).—*First Prize* (£5) to Solohead Co-operative Dairy Society, Limerick. *Second Prize* (£3) to Leekpatrick Co-operative Agricultural and Dairy Society, Ltd., Artigarvan, Strabane. *Third Prize* (£2) to Kiltoghert Co-operative Agricultural and Dairy Society, Ltd., Carrick-on-Shannon, Co. Leitrim. *Fourth Prize* (£1) to Moneymore Co-operative Dairy Society, Moneymore, Co. Derry. *Fifth Prize* (10s.) to Newcastle West Co-operative Agricultural and Dairy Society, Ltd., Limerick.

Class 63—CURED BUTTER (not less than 28 lbs., slightly salted. Packages (non-returnable) to be taken into consideration).—*First Prize* (£5) to Tamnaskenny Co-operative Agricultural and Dairy Society, Ltd., Cookstown, Co. Tyrone. *Second Prize* (£3) to Rose Bower Dairy Co., to Cashel, Co. Tipperary. *Third Prize* (£2) to Charles Prideaux, The Creamery, Motcombe, Dorset. *Fourth Prize* (£1) to Moneymore Co-operative Dairy Society, Moneymore, Co. Derry. *Fifth Prize* (10s.) to Glenwilliam Co-operative Dairy Society, Ltd., Ballingarry, Co. Limerick.

Class 64—CURED BUTTER (56 lbs. Packages (non-returnable) to be taken into consideration).—*First Prize* (£5) to Tamnaskenny Co-operative Agricultural and Dairy Society, Ltd., Cookstown, Co. Tyrone. *Second Prize* (£3) to Charles Prideaux, The Creamery, Motcombe, Dorset. *Third Prize* (£2) to Newcastle West Co-operative Agricultural and Dairy Society, Co. Limerick. *Fourth Prize* (£1) to Glenwilliam Co-operative Dairy Society, Ballingarry, Co. Limerick. *Fifth Prize* (10s.) to Centenary Co-operative Creamery Co., Ltd., Ballyduff, Thurles, Co., Tipperary.

Class 65—FANCY OR ORNAMENTAL DESIGN IN BUTTER, with foliage or other extraneous decoration.—*First Prize* (£3) to Miss H. M. Trenchard, Uphay Farm, Axminster. *Second Prize* (£2) to Miss B. M. G. Dare, Bowshot Farm, Charmouth, Dorset.

Class 66—FANCY OR ORNAMENTAL DESIGN IN BUTTER, without extraneous decoration, adapted for table use.—*First Prize* (£3) to Miss H. M. Trenchard, Uphay Farm, Axminster. *Second Prize* (£2) to Mrs. Custance, Southwater, Horsham.

COLONIAL BUTTER.

Class 67—SALT BUTTER (one box, containing not less than 56 lbs.).—*First Prize* (Silver Medal and £5) to Downs Co-operative Dairy Co., Ltd., Toowoomba, Queensland. *Second Prize* (Bronze Medal and £3) to Framlingham Butter Factory, Framlingham, Victoria. *Third Prize* (£2) to North Coast Co-operative Co., Ltd., Byron Bay, New South Wales.

Class 68—FRESH BUTTER (one box, containing not less than 56 lbs.).—*First Prize* (Silver Medal and £5) to N. Westphalen, Robertstown, South Australia. *Second Prize* (Bronze Medal and £3) to Warrnambool Butter Factory, Warrnambool, Victoria. *Third Prize* (£2) to A. W. Sandeford and Co., Adelaide, Australia.

CREAM.

Class 69—CLOTTED CREAM, in vessels ready for sale. Not less than 2 lbs. nor more than 3 lbs. in one or more vessels).—*First Prize* (Silver Medal) to

Mrs. L. R. Mildon, Higher Mead Down, Rackenford, Morchard Bishop, Devon. *Second Prize* (Bronze Medal) to Miss E. G. Enerest, Chippens Bank, Hever, Kent.

Class 70—CREAM, OTHER THAN CLOTTED, in vessels ready for sale. (Not less than 2 lbs. nor more than 3 lbs., in one or more vessels).—*First Prize* (Silver Medal) to Mrs. L. R. Mildon, Higher Mead Down, Rackenford, Morchard Bishop, Devon. *Second Prize* (Bronze Medal) to A. A. Willmott, Horeham Road, Sussex.

SKIM-MILK BREAD AND SCONES—(MIXED WITH SKIM-MILK
IN LIEU OF WATER).

Class 71—WHITE BREAD (2 loaves, not exceeding 2 lbs. each).—*First Prize* (Silver Medal) to A. Wiegand & Sons, Seven Kings, Essex. *Second Prize* (Bronze Medal) to Thos. Taylor, 106, Union Road, Oswaldtwistle, Lancs.

Class 72—BROWN BREAD (2 loaves, not exceeding 2 lbs. each).—*First Prize* (Silver Medal) to John Moritz, 27, Barlow Street, Walworth, S.E. *Second Prize* (Bronze Medal) to James B. Cox, Gordon Estate Bakery, St. Margarets-on-Thames.

Class 73—FANCY BREAD (not exceeding 4 lbs.).—*First Prize* (Silver Medal) to John Moritz, 27, Barlow Street, Walworth, S.E. *Second Prize* (Bronze Medal) to Trotter Bros., York Road Steam Bakery, Leicester.

Class 74—HOME-MADE BREAD (2 loaves, not exceeding 2 lbs. each).—*First Prize* (Silver Medal) to Mrs. Avery, Hyde Farm, Luton, Beds. *Second Prize* (Bronze Medal) to Mrs. S. A. Keirley, Hole House Farm, Cliviger, near Burnley.

Class 75—TWELVE SCONES, Baked on Girdle or Plate, any shape, not exceeding 6 ozs. each, without Fruit.—*First Prize* (Silver Medal) to Trotter Bros., York Road Steam Bakery, Leicester. *Second Prize* (Bronze Medal) to The Albion Bakeries, 7, Fairhazel Gardens, Hampstead, N.W.

HONEY, &c.

Class 76—TWELVE JARS OF LIGHT-COLOURED EXTRACTED HONEY (1 lb. each approximate weight).—*First Prize* (£1) to John Stone, Little Cabley, Sudbury, Derbyshire. *Second Prize* (15s.) to T. G. Hillier, Hurstbourne Tarrant, Andover. *Third Prize* (12s. 6d.) to Richard Brown & Sons, Flora Apiaries, Somersham, St. Ives, Hunts. *Fourth Prize* (10s.) to Joseph Boyes, Queen's Head Hotel, Cardiff.

Class 77—TWELVE JARS OF MEDIUM-COLOURED EXTRACTED HONEY (other than Heather Honey), 1 lb. each approximate weight.—*First Prize* (£1) to E. C. R. White, Newton Tovey, near Salisbury. *Second Prize* (15s.) to Dr. R. Sutherland, Moretonhampstead. *Third Prize* (12s. 6d.) to S. G. S. Leigh, Broughton, Hants. *Fourth Prize* (10s.) to Richard Brown, and Sons, Flora Apiaries, Somersham, St. Ives, Hunts.

Class 78—TWELVE JARS OF DARK-COLOURED EXTRACTED HONEY, including any variety of Heather mixture (1 lb. each approximate weight).—*First Prize* (15s.) to James Pearman, Penny Long Lane, Derby. *Second Prize* (10s.) to John Willson, York Villas, Shirebrook, near Mansfield.

Class 79—TWELVE JARS OF RUN (Ling, *Caluna Vulgaris*) HEATHER HONEY (1 lb. each approximate weight).—*First Prize* (15s.) to James Pearman, Penny Long Lane, Derby. *Second Prize* (10s.) to W. Sproston, Shugborough, Great Haywood, Staffs.

Class 80—TWELVE JARS OF GRANULATED HONEY OF 1906, or any previous year (1 lb. each approximate weight).—*First Prize* (£1) to Richard Brown and Son, Flora Apiaries, Somersham, St. Ives, Hunts. *Second Prize* (10s.) to C. Lodge, High Easter, Chelmsford, Essex.

Class 81—TWELVE SECTIONS OF HONEY, OTHER THAN HEATHER (size $4\frac{1}{2}$ by $4\frac{1}{2}$; 1 lb. each approximate weight).—*First Prize* (£1) to James Lee and Son, Martineau Road, Highbury, N. *Second Prize* (15s.) to E. C. R. White, Newton Tovey, near Salisbury.

Class 82—SIX SECTIONS OF HEATHER HONEY (1 lb. each approximate weight).—*First Prize* (£2) to Richard Brown & Son, Flora Apiaries, Somersham, St. Ives, Hunts.

Class 83—DISPLAY OF COMB AND EXTRACTED HONEY, of any year (approximately 100 lbs. in weight, shown on a space of 3ft. by 3ft.).—*First Prize* (£2) to Richard Brown & Son, Flora Apiaries, Somersham, St. Ives, Hunts.

Class 84—WAX (not less than 2 lbs., in 2 cakes only; the Produce of the Exhibitor's Apiary; extracted and cleaned by the Exhibitor or his assistants).—*First Prize* (15s.) to E. C. R. White, Newton Tovey, near Salisbury. *Second Prize* (10s.) to C. Lodge, High Easter, Chelmsford, Essex. *Third Prize* (7s. 6d.) to James Lee & Son, Martineau Road, Highbury, N.

Class 85—WAX (not less than 3 lbs.; the Produce of the Exhibitor's Apiary; extracted and cleaned by the Exhibitor or his assistants; to be shown in shape, quality, and package suitable for the retail trade). *First Prize* (15s.) to James Pearman, Penny Long Lane, Derby. *Second Prize* (10s.) to Fred Harris, High Felry, Sibsey, near Boston, Lincs.

Class 86—INTERESTING AND INSTRUCTIVE EXHIBIT OF A PRACTICAL OR SCIENTIFIC NATURE, connected with Bee Culture, not mentioned in the foregoing Classes.—No entry.

ROOTS, &c.

Class 87—SIX SPECIMENS OF LONG MANGOLDS, drawn from a crop of not less than two acres.—*First Prize* (£3) to P. le Feuvre, Mornille House, St. Owen's, Jersey. *Second Prize* (£2) to Lady Wantage, Lockinge House, Wantage. *Third Prize* (£1) to T. W. Purser, Tan House, Colnbrook.

Class 88—SIX SPECIMENS OF GLOBE MANGOLDS, drawn from a crop of not less than two acres.—*First Prize* (£3) to Jas. Bowden, Lancelevy Farm, Sheffield-on-Loddon, Basingstoke. *Second Prize* (£2) to Lady Wantage, Lockinge House, Wantage. *Third Prize* (£1) to Leonard J. Smith, The Scarr Farm, Newent, Gloucestershire.

Class 89—SIX SPECIMENS OF TANKARD OR INTERMEDIATE MANGOLDS, drawn from a crop of not less than two acres.—*First Prize* (£3) to P. le Feuvre, Morville House, St. Owen's, Jersey. *Second Prize* (£2) to J. B. le Feuvre, Lecoin Farm, St. Brelade's, Jersey. *Third Prize* (£1) to Jas. Bowden, Lancelevy Farm, Sheffield-on-Loddon, Basingstoke.

Class 90—SIX SPECIMENS OF SWEDE, any variety, drawn from a crop of not less than two acres.—*First Prize* (£3) to H. Bulford, Water Eaton, Oxford. *Second Prize* (£2) to Mrs. Dring, Rockgrove, Little Island, Co. Cork. *Third Prize* (£1) to Mrs. Dring.

Class 91—COLLECTION OF ROOTS, &c., for Cattle Feeding in Winter. To consist of Six Specimens of as many as possible of the following: Mangolds, Swedes, Turnips, White Carrots, Red Carrots, Potatoes, Beetroot, Kale, Kohl-Rabi, Parsnips, and Cabbages.—*First Prize* (£5) to Mrs. McIntosh, Havering Park, Romford. *Second Prize* (£3) to Lady Wantage, Lockinge House, Wantage. *Third Prize* (£2) to Mrs. McIntosh.

INVENTIONS, &c.

Class 92—MILK STRAINER, OR STRAINER AND FILTER COMBINED, capable of effectively dealing, other than by centrifugal force, with at least 100

gallons of milk in an hour.—*First Prize* (Gold Medal) to The Dairy Outfit Co., Ltd., 251-255, Pentonville Road, King's Cross, N., for "Milk Filter for Country Use." *Second Prize* (Silver Medal) to Burmeister & Wain, Ltd., Middle Abbey Street, Dublin, for "'Perfect' Milk Strainer and Filter Combined." *Third Prize* (Bronze Medal) to Thomas Grayson, 16 and 17, Queen Street, Derby, for "Milk Strainer and Filter Combined."

Class 93—ANY OTHER NEW INVENTION relating to Dairy Industry, or one showing distinct and practical improvement, not eligible for competition in any other Class, and not previously exhibited at the Dairy Show.—*Silver Medal* to The Dairy Supply Co., Ltd., Museum Street, London, W.C., for "Dr. N. Gerber's 'Sal' Butyrometer." *Silver Medal* to Robert Boby, Ltd., St. Andrew's Works, Bury St. Edmund's, Suffolk, *Silver Medal* to Burmeister & Wain, Ltd., Middle Abbey Street, Dublin, for "New 'Perfect' Hand Separator, No. 5." *Bronze Medal* to The Dairy Supply Co. Ltd., for "'Swiftsure' Bottle-filling Machine." *Bronze Medal* to H. Bartram, 7, Denman Street, London Bridge, S.E., for "'L. K. G.' Milking Machine." *Bronze Medal* to Blackstone & Co. Ltd., Stamford, for "Improved Swath Turner and Collector." *Bronze Medal* to W. Hopkins, Stadacona, Morena Park Road, Cheltenham, for "'Churn Lid Fastener." *Bronze Medal* to George John Blackburn, Oarside Dairy Farm, Liscard, Wallasey, Cheshire, for "Apparatus for Measuring and Filling Bottles."

BUTTER-MAKING CONTESTS.

Class 94—Section A.—Open to those who have never won a Prize at any Show, wherever held.—*First Prize* (£3) to Miss Mollie Kavanagh, Munster Institute, Cork. *Second Prize* (£2) to Miss Josie Cassidy, Munster Institute, Cork. *Third Prize* (£1) to Miss Alice Jones, Newton Farm, Cowbridge, Glam.

Class 94—Section B.—*First Prize* (£3) to Miss Edith McEntogart, Munster Institute, Cork. *Second Prize* (£2) to Miss Helen Cadwallader, British Dairy Institute, Reading. *Third Prize* (£1) to Miss Josephine O'Hanlan, Munster Institute, Cork.

Class 95—Open to Students who have attended Classes at the British Dairy Institute, Reading, for not less than one month during the past two years.—*First Prize* (£3) to Miss Iris Lilian Bull, The Dairy, Hursley Park, Winchester. *Second Prize* (£2) to Miss H. J. M. Taylor, British Dairy Institute, Reading. *Third Prize* (£1) to Miss Ethel Morris, British Dairy Institute, Reading.

Class 96—Section A.—Open to Women only.—*First Prize* (£3) to Mrs. N. Comer, Fanshaw's Farm, Hertford. *Second Prize* (£2) to Mary P. Comer, Fanshaw's Farm, Hertford. *Third Prize* (£1) to Miss Josie Cassidy, Munster Institute, Cork.

Class 96—Section B.—*First Prize* (£3) to Miss Ethel W. Williams, Lodge Farm, Bridgtown, Cannock, Staffs. *Second Prize* (£2) to Miss Mary Jenkins, Church Farm, Oddingley, Droitwich. *Third Prize* (£1) to Miss Martha Matthews, Snape Hall, Whitmore, near Newcastle, Staffs.

Class 96—Section C.—*First Prize* (£3) to Miss Maggie James, Great Llanesyo, Usk. *Second Prize* (£2) to Miss E. M. Powell, Ballingham Court, Hereford. *Third Prize* (£1) to Miss D. K. Perrett, The Manor, Charlcourt, Bath.

Class 97—Section A.—Open to Men and Women.—*First Prize* (£3) to Miss Isa White, Wolfe's & Joyes Farm, Noak Hill, Romford. *Second Prize* (£2) to T. A. Burridge, Greatbridge, Romsey. *Third Prize* (£1) to Miss R. Goodwin, Aston Hill Farm, near Stone, Staffs.

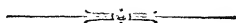
Class 97—Section B.—*First Prize* (£3) to Miss Jane Garbutt, Asylum, Tooting. *Second Prize* (£2) to Aubrey Roberts, Upton Farm, Banbury, Oxon. *Third Prize* (£1) to Miss Josie Cassidy, Munster Institute, Cork.

- Class 97—Section C.—*First Prize* (£3) to Miss H. J. M. Taylor, British Dairy Institute, Reading. *Second Prize* (£2) to Miss Martha Matthews, Snape Hall, Whitmore, near Newcastle, Staffs. *Third Prize* (£1) to Miss S. Sapsed, Dane End Farm, Little Munden, Ware.
- Class 98—Open to *First Prize* Dairy Show Winners of 1907.—*First Prize* (£3) to Miss Jane Garbutt, Asylum Farm, Tooting, S.W. *Second Prize* (£2) to Mrs. N. Comer, Fanshaw's Farm, Hertford. *Third Prize* (£1) to Miss E. W. Williams, Lodge Farm, Bridgtown, Cannock, Staffs.
- Class 99—Champion Contest.—Open to winners of *First Prizes* in the preceding Classes, or at the Dairy Show of 1906. Champions of any year excepted.—*First Prize* (Lord Mayor's Champion Cup and £5) to Miss E. W. Williams, Lodge Farm, Bridgtown, Cannock, Staffs. *Second Prize* (£3) to Mrs. N. Comer, Fanshaw's Farm, Hertford. *Third Prize* (£2) to Miss M. Kavanagh, Munster Institute, Cork.

MILKERS' CONTESTS.

- Class 101.—Open to Men over 18.—*First Prize* (£5) to J. D. Toogood Parsons, Manor View, Rusthall, Tunbridge Wells. *Second Prize* (£3) to W. A. Chappell, Fountains, Ripon. *Third Prize* (£2) to G. B. Nelson, Cockerham Hall, near Garstang.
- Class 102.—Open to Boys under 18.—*First Prize* (£5) to Frank Hampshire, Cefn Tilla Farm, Usk. *Second Prize* (£3) to William F. Snell, Marsh Farm, Yeovil. *Third Prize* (£2) to Guy Hawkins, Sandling Farm, Maidstone, Kent.
- Class 103.—Open to Women over 18.—*First Prize* (£15) to Miss J. M. Collins, Lower Mellingey, Perran Well Station, Cornwall. *Second Prize* (£10) to Mrs. Askew, Stone Row Head Farm, Lancaster. *Third Prize* (£5) to Miss E. Masson, The Dairy Cottage, Floors Castle, Kelso. Four *Equal Fourth Prizes* of £3 each respectively to Miss Helen Young, Chadwell Place, Chadwell St. Mary's, Grays; Mrs. Jane Nisbet, Great Blunts Farm, Ingatestone; Mrs. W. H. Purnell, Corner Pool Farm, Boadfield, Wrington; Miss Margaret E. Nelson, Cockerham Hall, near Garstang. The *First*, *Second*, and *Third Prizes* in this Class (£30) were offered by the Right Hon. Lord Northbourne.
- Class 104.—Open to Girls under 18.—*First Prize* (£5) to Miss Sarah Nelson, Cockerham Hall, near Garstang. *Second Prize* (£3) to Miss Mary L. Nisbet, Lordship, Hinxton. Saffron Walden. *Third Prize* (£2) to Miss R. J. Masson, Attimore Hall, Welwyn.

THE British Dairy Farmers' Association.



Patron—HIS MAJESTY THE KING.

President (1908)—SIR GEORGE BARHAM, J.P.



OBJECTS AND ADVANTAGES.

The objects of the Association are the improvement of

DAIRY STOCK AND DAIRY PRODUCE,

by encouraging the Breeding and Rearing of Stock for the special purpose of the Dairy ; a larger and more general production of Butter, Cheese, and Eggs ; the Erection of Improved Dairy Buildings, and the Invention of New or Improved Dairy Utensils, Machinery, Implements, and Scientific Appliances. The Association also stimulates the Breeding and Rearing of Poultry, &c. By means of papers in the Society's *Journal* (published annually), Annual Conferences in different dairy districts, Lectures, and Discussions, and in other ways, efforts are continually being made to disseminate a more thorough knowledge of Dairy husbandry.

Prizes to the value of upwards of £2,000 are annually offered for competition at the Dairy Show held at the Royal Agricultural Hall, Islington, London.

It is difficult to over estimate the importance and need of greater attention being paid to the Dairy industry. It is admitted that by improved modes of managing Milk and its products, the wealth obtained from the Milch Cows of the country could be increased most materially. The Council therefore appeal to Agriculturists of all classes, and Dairy Farmers in particular, who, by becoming Members of the Association, will practically aid in developing its usefulness.

The advantages of Membership comprise :—

- 1.—A free pass to all the Society's Dairy Shows, available each day during the Exhibition, with the privilege of admitting free (by ticket) a friend on any one day.
- 2.—The Exhibition of Live Stock, Dairy Produce, and Utensils at a reduced scale of fees.
- 3.—A copy (free by post) of the *Journal* of the Association, published annually ; price 1s. to non-Members.
- 4.—Analyses by the Analytical and Consulting Chemist, at low fees, of samples of milk, cream, butter, cheese, feeding stuffs, water, soil, manures, etc., and advice on dairy matters connected with his Department.
- 5.—Professional advice and assistance at a reduced scale of charges in any case of disease among the live stock of the farm.
- 6.—Examination of plants and seeds by the Consulting Botanist on specially low terms.
- 7.—Examinations by the Consulting Pathological Bacteriologist for particular pathogenic or disease-producing organisms.
- 8.—Investigations by the Consulting Dairy Bacteriologist into the cause of trouble or taints in dairy produce.

The annual Subscription is £1, but Dairy Instructors and *bona-fide* Tenant Farmers are admitted on payment of 10s. 6d. per annum. The latter sum entitles the Member to all privileges, except the reduced fees for exhibition at the Shows. A *bona-fide* Tenant Farmer is deemed to be one who rents the whole of the land in his occupation.

MEMBERS' VETERINARY PRIVILEGES.

Members of the Association who require professional assistance in any case of disease among their animals must apply direct to the Consulting Veterinary Surgeon, Mr. SIDNEY VILLAR, F.R.C.V.S., Harrow, Middlesex, whose scale of charge is as follows :—

	£	s.	d.
Personal Consultation	0	10	6
Post-mortem Examination and Report	0	10	6
Consultation by Letter	0	5	0
Visit and Report, in case of an outbreak of disease, in addition to personal and travelling expenses, per day	2	2	0

MEMBERS' BOTANICAL PRIVILEGES.

The Council have fixed the following rates of charge for the examination of Plants and Seeds for the *bona-fide* and individual use and information of Members of the Association (not being Seedsmen), who are particularly requested, when applying to the Consulting Botanist, to mention the kind of examination they require, *and to quote its number in the subjoined Schedule*. The charge for examination must be paid, in Postage Stamps or otherwise, at the time of

application, and the carriage of all parcels must be prepaid, the Parcel Post being recommended where practicable. It must be distinctly understood that *no notice can be taken* of any application unless it is accompanied by the proper fee.

No.	£	s.	d.
1.—A Report on the purity, and amount of nature of foreign materials, of a sample of seed	0	1	0
2.—A Report on the perfectness and germinating power of a sample of seed	0	1	0
Nos. 1 and 2 together	0	1	6
3.—Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means for its extermination or prevention	0	1	0
4.—Report on any disease affecting farm crops	0	1	0
5.—Determination of the species of a collection of natural grasses found in any district, with a report on their habits and pasture value	0	4	0

Instructions for Selecting and Sending Samples.

The utmost care must be taken to secure a fair honest sample. When possible, at least one ounce of grass and other small seeds should be sent, and two ounces of cereals or larger seeds. Grass seeds should be sent at least four weeks, and clover seeds two weeks before they are to be used. In collecting specimens of plants, the whole plant should be taken up, and the earth shaken from the roots. If possible, the plant must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel. Specimens of diseased plants or of parasites should be forwarded as fresh as possible—either in a bottle, or packed in tinfoil or oil silk. All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstance (soil, situation, etc.) which, in the opinion of the sender, would be likely to throw light on the inquiry. Parcels or letters containing seeds or plants for examination (carriage or postage prepaid) must be addressed to the Consulting Botanist, Professor John Percival, M.A., University College, Reading.

MEMBERS' CHEMICAL PRIVILEGES.

MILK (Fresh).	£	s.	d.
Estimation of Fat and Total Solids	0	2	6
Estimation of Fat, Casein, Albumin, Sugar, and Ash	0	10	6
MILK (Sour).			
Estimation of Fat and Total Solids	0	5	0
SKIMMED MILK.			
Estimation of Fat and Total Solids	0	5	0
CONDENSED MILK.			
Estimation of Fat	0	5	0
Estimation of Fat, Casein, and Solids	0	10	6
Estimation of Cane Sugar	0	5	0

							£	s.	d.
HUMANISED MILK.									
Complete Analysis..	..	..	..	..	..	..	1	1	0
CREAM.									
Estimation of Fat ..	..	..	..	..	..	..	0	5	0
Estimation of Fat, Casein, and Solids ..	..	..	..	..	..	..	0	10	6
Examination for Foreign Fats ..	..	..	..	..	..	..	0	10	6
BUTTER.									
Estimation of Water, Casein, and Ash ..	..	..	..	..	..	..	0	5	0
Examination for Foreign Fats ..	..	..	..	..	..	..	0	10	6
CHEESE.									
Estimation of Water, Fat, and Casein ..	..	..	..	..	..	..	0	5	0
Examination for Foreign Fats ..	..	..	..	..	..	..	0	10	6
RENNET.									
Examination of Strength..	..	..	..	..	..	..	0	5	0
CAKES AND MEALS.									
Estimation of Oil only ..	..	..	..	..	..	..	0	5	0
Estimation of Oil, Albuminoids, and Carbo-hydrates ..	..	..	..	..	..	..	0	10	6
GRASS, SILAGE, ROOTS, &c.									
Estimation of Oil, Albuminoids, and Carbo-hydrates, &c. ..	..	..	..	..	..	..	1	1	0
MANURES.									
Estimation of Phosphoric Acid ..	..	..	..	..	..	..	0	5	0
Estimation of Soluble and Insoluble Phosphoric Acid ..	..	..	..	..	..	..	0	7	6
Estimation of Nitrogen ..	..	..	..	..	..	..	0	5	0
Estimation of Potash ..	..	..	..	..	..	..	0	5	0
SOIL.									
Estimation of Lime ..	..	..	..	..	..	..	0	5	0
Analysis and Report ..	..	..	..	..	..	..	2	2	0
WATER.									
Analysis for Drinking or Dairy Purposes ..	..	..	..	..	..	..	1	1	0
Bacteriological Examination for Drinking or Dairy Purposes ..	..	..	..	..	..	..	0	10	6
POISONS.									
Examination of a Substance for Mineral Poisons ..	..	..	..	..	..	..	2	2	0
Examination for Organic Poisons (Alkaloids, &c.) ..	..	..	..	..	..	..	3	3	0
CIDER AND FERMENTED DRINKS.									
Estimation of Alcohol ..	..	..	..	..	..	..	0	5	0
Estimation of Alcohol, Sugar, Acidity, &c. ..	..	..	..	..	..	..	0	10	6
PRESERVATIVES.									
Examining a Substance for Boracic Acid or Salicylic Acid, &c., for each Substance sought ..	..	..	..	..	..	..	0	2	6
Estimation of the quantity of Boracic Acid ..	..	..	..	..	..	..	0	10	6
Analysis of a Preservative ..	..	..	..	..	..	..	1	1	0
COLOURING MATTER.									
Examination for Artificial Colouring ..	..	..	..	..	..	..	0	5	0
CONSULTATION.									
For letter in reply to Enquiry ..	..	..	..	..	..	..	0	5	0
For Personal Interview ..	..	..	..	..	..	..	0	5	0
For Special Consultation ..	..	..	..	..	..	..	1	1	0

NOTE.—The Consulting Chemist will be prepared to quote reduced terms to Members requiring a number of analyses at frequent intervals.

Instructions for Taking Fair Samples for Analysis.

Dairy Produce.—Milk should be sent in a well-corked 8oz. clear bottle. The milk should quite fill the bottle. Butter or Cheese, about 8 ounces; the former in a gallipot, well tied down.

Soils.—A block of soil about four or five inches square, and nine inches deep, should be sent in a strong box by rail.

Artificial Manures.—Take a handful of manure out of at least half a dozen bags, mix these rapidly and thoroughly, breaking down all lumps. Forward about a pound of the mixture in a tin box, and retain the remainder. Samples of manure should be sent immediately after the delivery of the bulk, and before settling the account. All manures should be brought subject to analysis.

Feeding Materials.—Feeding cakes, meals, or grains: About a pound should be sent in a bag or box. Grass and hay: A bundle of a few pounds weight. Silage: A six-inch cubic block, packed closely in a box to keep it compressed.

Waters.—A Winchester quart glass-stoppered bottle should be procured from a druggist, well washed out with water, then completely filled, the stopper tied securely down, and the bottle packed in a box and sent by rail.

N.B.—In order to prevent disappointment, the Chemist requests that, as far as possible, Members desiring to hold a personal consultation should make an appointment by letter. Between 12 and 3 are the hours most convenient. The fees for analysis of artificial manures and feeding stuffs are payable in advance, and only applicable to Members who are not commercially engaged in the manufacture or sale of the articles sent for analysis. All communications intended for the Analytical and Consulting Chemist must be addressed direct to F. J. Lloyd, F.C.S., Agricultural Laboratory, Muscovy House, 6, Trinity Square, London, E.C.

MEMBERS' BACTERIOLOGICAL PRIVILEGES.

EXAMINATIONS BY DR. ANDREWES, Pathological Laboratory,
St. Bartholomew's Hospital, London, E.C.

MILK.	£	s.	d.
Cultural and experimental examination for a particular pathogenic organism	2	2	0
PASTEURISED OR STERILISED MILK.			
Cultural and experimental examination for a particular pathogenic organism	1	1	0
CREAM, BUTTER, OR CHEESE.			
Cultural and experimental examination for a particular pathogenic organism	2	2	0
WATER.			
Cultural and experimental examination for a particular pathogenic organism	2	2	0

INVESTIGATIONS BY MR. F. J. LLOYD, F.C.S., Muscovy House,
6, Trinity Square, London, E.C., INTO THE CAUSES OF TROUBLE OR
TAINTS IN MILK, CREAM, BUTTER, OR CHEESE.

MILK.	£	s.	d.
Microscopical and cultural examination for a particular organism	2	2	0
Experimental and cultural examination for a particular organism	£5	5	0 to 10 10 0
CREAM, BUTTER, CHEESE.			
Microscopical examination	0	10	6
Microscopical and cultural examination	2	2	0
PASTEURISED OR STERILISED MILK.			
Microscopical examination for bacteria	0	5	0
Estimating number of bacteria present	0	10	6
Culture examination of bacteria present	2	2	0

Directions for Sending Samples.

Samples of milk or water (one quart) and cream (half-pint) should be forwarded in wide-mouthed stoppered bottles which have previously been thoroughly cleaned, and then rinsed several times with very hot, almost boiling, water.

Butter is best sent in a $\frac{1}{2}$ lb. brick or roll, just as it was made up, wrapped in grease-proof paper, and packed in a box.

If the *Cheese* is small, send a whole one; otherwise, forward a square block of not less than one pound, and not a wedge-shaped piece. Wrap in grease-proof paper, and pack in a box.

All samples should be sent by the speediest method possible. They ought not to arrive either on Saturday or Sunday.

Samples to be examined for disease-producing organisms should be forwarded to Dr. Andrewes, Pathological Laboratory, St. Bartholomew's Hospital, London, E.C. Members are requested to note that in the case of examination for the tubercle bacillus the method of animal inoculation, which experience has shown to be the only reliable one, will be alone used. It is impossible to carry out the process of sedimentation necessary for the detection of tubercle bacillus in milk which is received in a curdled condition. The report cannot be sent for a period of four to six weeks from the time the sample is received, but in the case of other pathogenic organisms the time required is much shorter. Samples to be examined for organisms producing taints in dairy produce should be forwarded to Mr. F. J. Lloyd, F.C.S., Muscovy House, 6, Trinity Square, London, E.C.

BRITISH DAIRY FARMERS' ASSOCIATION.

Half-yearly Report of the Council, presented to the General Meeting of
Members on Wednesday, October 9th, 1907.

In the Report which is usually submitted to the members at the Autumn Meeting, the subjects dealt with mainly relate to the Annual Dairy Show. There are, however, on this occasion one or two other matters to which the Council desire to allude.

During the past six years the Association has persistently urged the introduction of legislation designed to put an end to the frauds which have so long prevailed in the butter trade. In the early part of this year the Government introduced a Bill based on the recommendations of last year's Select Committee of the House of Commons on Butter Adulteration. That Bill was the subject of much adverse criticism, more particularly with regard to the amount of moisture allowed in substances other than butter, which had been previously allowed to be sold under the name of milk-blended butter. Vigorous efforts were made to upset this proposal, and the Council joined with many other bodies in vehemently protesting against it. On May 1st. it was unanimously resolved :—

“ That the Council strongly protest against the limit of 16 per cent. of moisture being exceeded in any article allowed to be sold under the Butter Bill.”

The subsequent progress of the measure was closely watched by the Council, who were instrumental in securing several desirable amendments pressed by their friends in the House of Commons. But being satisfied of the un wisdom of persisting in the protest above referred to, the Council at their July meeting urged the Government to pass the Bill into law with all possible despatch; and, although the opinion of the Council in respect to the moisture question remains unchanged, they are convinced that the measure, which happily passed its final stages before the end of the recent Session, will be to the advantage of both butter-makers and the general public.

A desire having been expressed by a number of members that the Dairy Conference and Excursions of 1908 should take place in Canada, the Conference Committee have instituted inquiries on the subject, and are about to circularise the members thereon, before taking more active steps to carry out the proposal. On a former occasion, when a visit to Canada was contemplated, the number of members who signified their intention to join in such a visit was insufficient to warrant the Council in organising it, and they are therefore particularly anxious to satisfy themselves as to the extent of the desire which has more recently been conveyed to them.

Referring to the thirty-second annual Dairy Show now in progress, Council have anxiously endeavoured to build up a thoroughly representative and creditable exhibition, embracing all sections of dairy farming and dairying, and one which should appeal to all engaged therein, as well as to the public generally. It is gratifying to find that these efforts have proved so successful, thanks largely to the friendly co-operation of members and exhibitors in all parts of the country. The schedule of prizes has been carefully revised and enlarged in the light of suggestions emanating from various sources. As will be seen by visitors, the extent of the Show is only bounded by the dimensions of the present buildings. Before another exhibition is held, these will be greatly extended, so that there will be still further scope for development and improvement. A comparative statement of entries for six years is appended:—

	1902.	1903.	1904.	1905.	1906.	1907.
Cattle	224	203	164	182	240	217
Milking and Butter Tests ..	214	186	167	217	247	207
Goats	49	30	46	51	51	51
Poultry	2,617	2,860	2,678	3,068	3,347	3,081
Pigeons	2,500	2,485	2,426	2,440	2,573	2,664
Poultry and Pigeon Appliances.	—	—	—	—	55	61
British Cheese	286	269	250	268	255	420
Bacon and Hams	50	79	46	49	39	57
Butter	571	555	556	641	578	593
Cream	57	59	44	52	42	35
Skim-Milk Bread, &c.	93	83	140	121	159	118
Honey, &c.	131	125	122	124	118	67
Egg and Butter Packages ..	—	17	20	—	—	—
New and Improved Inventions.	20	24	43	22	17	33
Vehicles for Conveying Milk ..	19	27	25	—	—	—
Roots	190	144	184	170	156	177
Butter-Making Contests	162	150	172	206	199	200
Milkers' Contests	46	36	55	66	121	135
	7,239	7,332	7,138	7,677	8,197	8,175

In accordance with the terms of the Articles of Association, twelve Members of the Council retire by rotation, of whom eleven offer themselves for re-election, viz:—

ALEXANDER, A. L.
 ASHCROFT, W.
 BELLASIS, Captain R. O.
 BROWN, W. C.
 CARR, RICHARDSON
 CARRICK, THOMAS

CARROLL, Professor T.
 LONG, Professor
 PAGE, S. P.
 TAYLOR, GEORGE
 WHITLEY, S. R.

The following new candidates have been nominated :—

FARMER, JOHN THOS. H., Langstone, Moretonhampstead, Devon.

KEEL, WALTER WILLIAM, Rectory Farm, Stanton Drew, near
Bristol, Somerset.

ROBINSON, JOSEPH C., Iford, Lewes, Sussex.

SADLER, JAMES, Crewe Gates Farm, Crewe.

The results of the voting will be announced at a later stage of the General Meeting.

By Order of the Council.

WILLIAM C. YOUNG,

Secretary.

Thirty-Second Annual Report of the Council to the General Meeting of Members, Wednesday, April 1st, 1908.

In presenting their thirty-second Annual Report and Statement of Accounts, the Council are happy to record that the past year has been one of sustained activity and success. At the present time, after deducting the losses caused by death, removal, resignation, etc., the Association consists of 1,019 members, a net increase of six during the year; while three kindred Associations are affiliated, with representatives on the Council.

By the votes of the members, Mr. J. C. Robinson (Sussex) and Mr. James Sadler (Cheshire) have been placed on the Council; while Mr. Sidney Villar, F.R.C.V.S., has been chosen to fill a vacancy caused by the retirement of Captain J. W. Smith-Neill.

As will be seen by the accounts accompanying this report, the Society's finances are in a sound and healthy condition. After making a purchase of £500 L. & N. W. Railway 3 per cent. Debentures, thus increasing the Society's invested funds to £2,615 14s. 7d., the year closed with a balance in hand of £664.

Departing from the previous practice of visiting essentially dairy districts, the Annual Conference and Excursions for 1907 were held in the Counties of Kent and Sussex. Thanks to the kind and generous co-operation of members and friends resident in these counties, an excellent programme was prepared and carried out, the entire proceedings proving conspicuously successful. The South Eastern Agricultural College at Wye, and a number of notable farms and estates, were included in the itinerary, which occupied four memorable days. The Council record their indebtedness to all those gentlemen who assisted in making the gatherings in every way pleasurable and profitable.

Responding to the wish which has been expressed in several quarters that the Association should organise a visit to Canada, the Council have by circular invited members to notify the probability of their joining in such a trip, commencing on or about July 10th, and returning five weeks later, except in the case of those who are able to make a more prolonged visit to the Dominion. It is greatly to be regretted, however, that the replies are not sufficiently encouraging to warrant the Council in organising the tour, which has consequently been abandoned for this year.

The main feature of the year's work—the thirty-second Dairy Show—involving a vast amount of organisation on the part of the Committee charged with its promotion—was generally considered one of the best yet held. The total receipts were practically the same as those of the previous year, but although expenditure was materially increased in several directions, the Committee are happy to record a profit of about £350. At future Shows.

the Association will have a greatly increased floor space at their disposal, and an endeavour will be made to utilise this advantageously. The Dairy Show of 1908 is appointed to be held on October 6th, 7th, 8th, and 9th.

The Council continue to be associated with the University College, Reading, in the maintenance and control of the British Dairy Institute, with the practical recognition of the Board of Agriculture, who have again made their customary grant of £300 for the year ending March 31st, 1908. Two examinations for the Society's Diplomas and Certificates were held at the Institute during 1907, and one at Chelmsford at the request of the Essex County Council. The following awards resulted :—

- 7 Diplomas for proficiency in the science and practice of dairy farming and dairying.
- 3 Teachers' certificates.
- 8 Certificates of proficiency in the principles and practice of butter and Cheddar cheese making.
- 7 Certificates of proficiency in the principles and practice of Cheddar cheese making.
- 11 Certificates of proficiency in the principles and practice of butter making.

In the early part of last year the Council joined in a representative deputation to the Board of Agriculture, urging the Government to deal with the whole subject of milk production and distribution by general legislation instead of by Local Acts, such as have been in recent years promoted by various corporations. It is probable that the Government proposals will soon be available, and in the meantime the Council have formulated their views, insisting that no legislation affecting the dairy industry, and especially in regard to the production of milk, will be satisfactory to those engaged in the industry unless it provides as under :—

1.—That the Dairies, Cowsheds, and Milkshops Orders of 1885 and 1899 be consolidated and amended in such manner as shall be approved by the Board of Agriculture.

2.—That adequate legislative steps shall be taken to secure the proper (a) lighting, (b) ventilation, (c) cleansing, (d) drainage, (e) water supply, of such cowsheds in both Urban and Rural District areas ; provision being also made for the proper cleansing of cows and premises adjoining the cowsheds.

3.—That the question of air space in existing cowsheds shall not be dealt with by hard-and-fast regulations, but that regard must be had in all cases to the situation and surroundings, and any regulations dealing with this matter must be subject to the approval of the Board of Agriculture.

4.—That every County Council shall only register such premises as they may deem suitable, and when the premises to be occupied as a dairy or cowshed shall have been made so as to satisfy their requirements.

5.—That all premises occupied for the purpose of milk selling within the meaning of the Dairies, Cowsheds, and Milkshops Orders shall be inspected by the Inspector to the County Council not less than twice in

6.—That all cattle used for the purpose of milk selling shall be examined (especially for tuberculosis of the udder) by duly qualified veterinary surgeons appointed by the County Council not less than twice in each year.

7.—That every animal which appears to show symptoms of tuberculosis of the udder shall be isolated, and the County Council informed thereof. That if considered by the Council's Veterinary Surgeon to be so suffering the cow shall be slaughtered. Previous to the slaughter the cow shall be valued as a milking cow by a public valuer appointed by the Board of Agriculture. Immediately after slaughter the cow may, at the request of the owner, be examined either by an independent veterinary surgeon or by one appointed by the Board of Agriculture. If free from tuberculosis of the udder, the full value shall be paid to the owner (plus two pounds to cover the loss sustained by dislocation of his business) out of the National Exchequer. If affected with tuberculosis of the udder, three-fourths of the value shall be paid out of the National Exchequer. The County Council to bear and pay any cost of any valuer or veterinary surgeon employed for this purpose.

8.—The Model Milk Clauses, or any similar clauses to the same effect contained in all previous private Acts, to be repealed.

9.—That the Dairies, Cowsheds, and Milkshops Orders of 1885 and 1899, as consolidated and amended, be made compulsory.

10.—That any legislation when brought into effect shall be administered by the Board of Agriculture and the County Council.

The Council are further of opinion that the importation of fresh milk and fresh cream should be prohibited in view of the fact that this country possesses no control over the sources of supply.

At the initiative of the Royal Agricultural Society of England, the Council have appointed delegates to serve on a National Committee called the Tuberculosis (Animals) Committee—representing the Cattle, Breed, Dairy, and other Societies—formed for the purpose of watching the interests of agriculture in view of possible legislation with regard to milk and meat supply.

By Order of the Council,

WILLIAM C. YOUNG,

Secretary.

12, Hanover Square,
London, W.,

March, 1908.

British Dairy Farmers' Association.

Dr. FINANCIAL STATEMENT, Year ending December 31st, 1907. Cr.

CASH ACCOUNT.

	£	s.	d.	£	s.	d.
BALANCE, 31st December, 1906..	668	11	6	1,050	7	9
RECEIPTS to 31st Dec., 1907:—						
Members' Subscriptions..	15	1	7			
Journal ..	298	2	8			
Conference ..	13	15	0			
Examinations ..	62	4	6			
Interest on Investments ..	1	0	0			
Miscellaneous..				1,058	15	3
				72	5	0
Carried forward..				1,131	0	31,050 7 9

DAIRY SHOW, 1906:—

Fees ..	20	0	0
Advertisements ..	45	13	6
Prize Fund ..	3	2	0
Miscellaneous..	3	9	6

	£	s.	d.	£	s.	d.
EXPENDITURE to 31st December, 1907.—						
Rent ..	112	14	6			
Salaries ..	309	10	0			
Printing and Stationery ..	37	16	3			
British Dairy Institute, Reading:—						
Current year's work..	200	0	0			
Examinations ..	68	12	8			
Conference ..	310	7	5			
Journal ..	159	4	10			
Education ..	17	14	6			
Postage ..	37	8	9			
Officers' Retaining Fees ..	31	10	0			
Auditors' Fees ..	18	18	0			
Analyses..	11	11	0			
Miscellaneous Expenses, including						
Subscription to Central Chamber						
of Agriculture, Mansion House						
Association on Railway Rates,	77	8	2			
Bankers' Charges, and Sundries..						
Investment, £500 L. & N. W. Rail-						
way 3 per Cent. Debenture Stock	475	0	6			
				1,867	16	7

DAIRY SHOW, 1906:—

Sundry Payments ..	28	16	4
Carried forward	1,896	12	11



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JOURNAL
OF THE
British Dairy Farmers'
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Vol. XXIII

1909.

PRICE 1s. (*Free to Members.*)

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London:

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THE CHESHIRE CHEESE INDUSTRY.

By Mrs. M. BLACKSHAW, Holly Bank, Marton, Chelford.

Cheshire has long been noted for the excellence of its cheese, and "Cheshire Cheese" has probably the most ancient reputation of any standard British variety, its speciality being an old and well established fact.

The richest and best cheese made in Cheshire was formerly said to be produced from land of an inferior nature, while the greatest quantity was yielded from the more fertile pastures.

This old idea was doubtless correct so long as the old process was followed, but now that science has taught us how to adapt the process to suit the altered condition of the milk, it no longer holds true.

To the casual observer, unacquainted with either the theory or practice of cheese-making, the process of manufacture would doubtless appear to be of a simple nature, requiring only a knowledge of some few operations, and a certain amount of patience, in order to bring the work to a successful termination. But the cheese-maker who has gained proficiency by overcoming innumerable difficulties knows that such is far from being the case, for he it is who is the first to admit the necessity of careful and constant observation in order to obtain cheese always even in character and of the best quality.

In the past the various duties to be performed in the average farm house, coupled in many cases with the very limited convenience for cheese making, made the business a difficult and anxious matter; further, it is to be feared that in only too many cases there was a great lack of definite measurements. For example, the temperature of the milk was ascertained by feeling with the hand, or in some cases with the elbow.

Thermometers were very little used twenty-five or thirty years ago, and the clean, simple, floating dairy thermometer which is such an inestimable blessing in dairying was then a thing almost unknown.

Rennet in the form of "skins" (the Calf's stomach, prepared, hung up to dry, a small piece cut off each morning and steeped in water 24 hours) was used to coagulate the milk, which use resulted in a great amount of uncertainty as to the time it would take to "set." This "rule of thumb" is a very old grievance.

An old Agricultural Report on the County, called "Holland's Survey," published about a century ago, states, when noticing the dairy produce of the county of Cheshire, "that an exact uniformity does not prevail in every part of the process is no

wonder, for there is not any of the business which is conducted in a dairy that tends to the least chemical exactness."

With the advance of scientific knowledge, rapid strides have in recent years been made towards reducing the system of manufacture to a definite process, yet we still find in different parts of the county considerable divergence in methods employed, due in some cases to lack of convenience, in others to its requiring two or three days' milk supply to produce curd sufficient for a cheese, and in other cases to the conservatism of the maker for ancient methods.

A few are still to be found who use "skins" instead of the extract of rennet. These usually make on the "cool" method, and will probably keep the curd unsalted from one day to another before adding salt, in this way gaining an uncertain amount of acidity, which, in consequence, results in the cheese produced being often difficult to dry and frequently made bitter in flavour.

Most of these makers will now use the thermometer, but comparatively few will measure the milk, thus the rennet is put into the milk by "guess"—the usual custom being to allow so many spoonfuls to the lot—a practice that cannot be too strongly condemned.

How much greater must be the confidence of those who add to the milk in definite proportion rennet of known strength, and how much more certain the result?

Approximately, it is now some twenty years since systematic instruction in cheese-making was first inaugurated, and from that time rapid improvements have taken place.

It is, of course, true that the general principles remain the same as of old, but technical education has shown the necessity for attention to details if success is to be attained.

Reliable information and data are now at the command of cheese-makers concerning the effect of temperature on milk or curd, the influence of too much or too little rennet, and the parts played by acidity and salt. The more one studies these known facts, the more it is brought home to us that the art of cheese-making is not to be hastily acquired, for it is clear that accurate measurements at all stages are absolutely essential to uniformity of results, and that certain of those measurements are almost too delicate to be ascertained by practical chemical tests, and can only be judged by knowledge gained by long experience.

It is for these reasons that old "rule of thumb" methods cannot be expected to produce a uniform product. Nevertheless, it must be acknowledged that there are a few cases where makers following old processes and guided by old measurements turn out cheese of excellent character.

In such cases it must be due to experience reduced to system. But, whatever the cause may be, we would advise such makers to continue in their success, and not attempt to mix new wine with old.

In all manufacturing industries, it is a general principle that the demand shall control the supply.

Particularly is this the case with cheese-making, for the maker has almost yearly to make slight changes in his process in order that his product shall be in accordance with what the public demands. The change in the consumers' demand during late years has been in the direction of greater mildness in flavour, which means that the makers must not allow so much acidity to develop in either the milk or the curd as was formerly the case.

The use of acidity is to help to expel the whey from the curd, and to form the texture of the cheese; the right quantity will give a rich velvety curd, which will develop into a meaty, fine-flavoured, mellow cheese; too much acidity will give a crumbly dry curd, which will ripen into a dry, hard cheese; and, again, too little will give a weak-flavoured, soft, spongy curd, resulting in a weak and often tainted cheese.

There are three recognised processes of Cheshire cheese-making, namely, early ripening, medium ripening, and long keeping.

By the early ripening process, the cheese is made and ready for consumption within four or five weeks. A few years ago a large number of makers followed this system, but it is gradually falling into disfavour, owing to the fact that a cheese which ripens quickly usually goes wrong quickly.

The medium ripening system produces cheese ready for sale within about eight weeks; and the long keeping method is one by which the cheese is ready in about three months, or will keep considerably longer if required.

Of the three systems, the medium ripening is now the most widely followed.

The modern method of medium ripening cheese-making, especially as followed in East Cheshire, to suit Manchester and district markets, may be described as follows:—

The night's milk must be strained into the milk vat and carefully attended to, the temperature being taken for the last time in the evening about 8-30 to 9-0 o'clock. It is very important that the night's milk should be in good condition when the morning's milk is added, because it is the foundation of the cheese, and if the foundation is defective the resulting product must suffer.

The milk must be stirred at intervals to keep down the cream, and if it is left at a temperature of 68° F. at 9 o'clock it will, in the average dairy, be found at 65° to 68° F. on the following morning before the new milk is added. Such temperatures and treatment will, as a rule, be found to procure a good workable condition of the milk.

In the morning the cream must be skimmed from the night's milk and placed in a pan, the pan afterwards being filled up with new milk, and the whole returned through the sieve into the milk vat. After the morning's milk is added to that of the previous evening, and the whole stirred together, add "starter" or "ripening"

to the milk, according as it is required by the state of the night's milk and the temperature of the dairy. For instance, if the temperature of the night's milk in the morning is 66° F., and the temperature of the dairy is under 65° F., add 1 pint of "starter" to each 40 gallons of milk, except in the hot summer months, when probably no "starter" is needed. Then raise the temperature of the milk to 84° F., add 6 drachms of rennet to each 20 gallons of milk, and stir carefully together until the milk is perceived to be thickening. At this stage stirring must cease at once, and the vat be covered up, and allowed to stand for 50 to 60 minutes to complete coagulation of the milk, or until when tried with the thermometer the curd breaks clear, showing that it is ready to cut.

When ready, turn over the top gently with the skimmer, cover, and allow to stand until clear whey comes to the surface. This usually takes about 5 to 8 minutes.

Notice the temperature when ready to cut, for it is desirable that it should be kept as even as possible. Cut twice each way, with an interval of 10 minutes between each time, to about the size of beans. Then stir carefully and add water in the linings of the vat to gradually raise the heat to 88° F. This part of the work will take about one hour from the time the curd was ready to turn over. At this stage the curd will be nicely firm, and somewhat loose, with a pleasant ripe smell, but no "sourness."

Allow it to stand one hour, or until, when the hand is placed in the vat, the curd is found slightly leaving the side of the vat, and when a handful is taken out and found to smell slightly ripe. The curd is then pushed up to one end of the vat, and the whey run off; after which the curd should be cut into squares, turned, and placed on the rack in a cloth.

Cut into four-inch cubes, turn over, and fold up in the cloth four or five times, with intervals of 15 minutes between, until the curd is sufficiently dry and ripe. It must then be cooled to 80°, ground through the curd mill, and salted with from 6½ ozs. in April, 7 ozs. in May, 8 ozs. from June and onwards, of salt to each 20 lbs. of curd. After the ground curd has been well mixed with the salt, it must be put into a cheese hoop lined with a cheese cloth, and when finished placed in the cheese oven, where it is kept warm to promote drainage.

The new cheese must be turned in the evening and replaced in the cheese oven. It should remain in the cheese oven two days before being put under press. While undergoing the pressing process, the cheese requires turning into a clean cloth every morning.

If well-made, and kept in an even temperature, the cheese does not require heavy pressure, and will be ready after three or four days to be taken out, bandaged, and capped. Caps should be taken off after a week or 10 days, and the cheese placed in the cheese room to ripen, turning being done daily.

NOTES.

Temperature of Dairy, 60° to 65° F.

„ Cheese Oven, 70° to 80° F.

„ Press Room, 65° F.

„ Cheese Curing Room, not under 60° or
over 65° F.

100 lbs. of curd makes a nicely-proportioned cheese in a 14-inch cheese mould.

The Cheshire cheese industry is a healthily progressing “art and science,” and is very perceptibly increasing in importance. At the Dairy Shows in the county and in London there is annually exhibited a larger amount of first-class cheese of fine appearance; and while Cheshire’s famous old makers still maintain their excellence, they have an ever increasing number of successful rivals.

PARTURIENT APOPLEXY.

By Professor JOHN PENBERTHY, F.R.C.V.S.

Wherever dairying is carried on under conditions similar to those obtaining in Great Britain, the liability of cows to an affection known to us by the above, or the more familiar names of "Milk Fever," and "Dropping after Calving," is recognised as a matter of considerable importance. Indeed, its occurrence is so general and widespread that it must be reckoned one of the most common of the serious ailments to which the dairy cow is subject. Cases usually occur singly and the intervals between them probably to some extent account for the absence of that alarm which tends to be associated with diseases whose subjects become affected so quickly one after the other as to suggest a common cause, or contagion. Unchecked the malady is very fatal, and without the application of measures for prevention or cure it would rank of all diseases the most costly to the cow-keeper.

Early records of the diseases of cattle indicate that this is by no means a newly recognised one, though it is probably more prevalent now than a century ago.

To the veterinarian the study of its nature has been a matter of profound interest, and I think it safe to assert that no sporadic bovine disease has been so generally discussed or proved more difficult to unravel. To account for the occurrence, innumerable theories have been advanced, the result being great diversity of opinion and many changes of views. Many different technical names have been adopted, the majority of which have proved as inappropriate and incorrect as the theories on which they have been constructed. "Parturient fever," "puerperal fever," "milk fever," "calf fever," are all misleading, as fever is not an essential of the complaint. "Parturient apoplexy," though custom compels our adopting the superscription here, is open to the objection that the state of apoplexy does not exist in the affection to which it refers. As, however, so often happens, while doctors are disagreeing as to theories and scientific terms, the layman, familiar from close observation with the conditions as they occur, adopts a name which clearly indicates the situation, and is so far correct and helpful. No name up to the present time is open to less objection than that of "dropping after calving," which has been in general use for at least a century past. It correctly represents what happens in the vast majority of cases, though occasionally the affection intended to be covered by the term occurs before calving.

Doubtless in rare instances the name is used to cover more than one disease which may affect cows about the time of calving,

but these other occurrences are relatively so uncommon in cows that for all practical purposes it may be regarded as quite appropriate. Neither the nomenclature, nor the distinguishing of one disease from another may be deemed essential for the stock-owner, but recognition of the fact that names often applied to the very common malady we are about to describe may be misleading, and that diseases of diverse natures may exist soon after parturition, indeed may co-exist in the same individual, may possibly supply the explanation as to why the treatment, usually successful, sometimes appears to entirely fail.

Females of all species are, after giving birth, liable to disease arising from infection through wounds in the womb or genital passages—true “parturient fever.” This condition occasionally affects mares, more frequently ewes and human females. In the case of the last it is properly termed “puerperal or child-bed fever,” and in all it is regarded contagious. This form of disease rarely affects cows, but curiously enough “dropping after calving” has been frequently described under the heading of “puerperal fever,” and by some people taken to be as of the same nature. Just twenty years ago an obstetric physician to one of our largest hospitals stated his conviction that “parturient apoplexy” or “milk fever” was analagous to puerperal fever of woman. Had this not been promptly controverted, it is possible that the poor old cow would have been saddled with another injustice, and accused of causing the death of breeding women and their progeny without giving them the chance of becoming infected with tuberculous milk.

It has been very commonly observed that just before or soon after calving a cow may remain lying down unable or unwilling to stand, though showing no other sign of illness, the appetite, consciousness, and general appearance being normal. This condition is known as “loin drop,” and by some assumed to be the result of the weight of the calf in the womb, while by others it is thought to be due to the same cause as dropping after calving acting only on those parts of the nerve centres which control movement.

The affection so generally known as “dropping after calving,” “parturient apoplexy,” and “milk fever,” is commonly believed to be a disease special to the cow, though it is occasionally alleged to manifest itself in goats habitually kept for milking purposes. There is no evidence of its occurrence in cows in the wild state, while there is every reason for looking on it as a consequence of domestication. Indeed, the malady is so intimately associated with the transformation of the cow into a remunerative milk factory that we are forced to regard it as largely dependent on the artificial conditions adopted to effect this end. The susceptibility to the disease increases with the development of the property of producing rich milk, and with the adoption of measures to intensify it. As any breed has become notorious for the possession of this quality, so have its cows acquired the reputation of being

predisposed to drop after calving. While Channel Islands cows have been for a long time known to be frequent sufferers, until recently it was commonly believed that those of the Hereford, Sussex, and other breeds enjoyed a perfect freedom from the malady, as they did from fitness for dairy purposes. Experience has, however, proved that when success has followed the attempt to form milking strains of any breed by artificial selection, though in the breed originally this affection was unrecognised or extremely rare, in the new strain the liability to drop has developed with the dairying qualities. There are, as far as we know, no grounds for supposing that the disease is dependent on breed apart from its possession of the property of producing rich milk. It is certain that cross-bred cows possessing this same quality are equally liable. Further, the malady usually affects cows at that period of life when the rich milk-producing powers are highly developed: the immense majority of attacks occur at the third or subsequent calving. Occasionally cases have been recorded as following the birth of the first, and more commonly after that of the second calf. It is by no means essential that the subject of the malady should carry a large amount of outside fat; indeed, though usually "fresh" in condition, the affected cow is often not apparently fat, but if slaughtered is usually found to carry a good deal of inside fat. It is, however, by no means a disease special to the lean cow, and is rare indeed in the ill-fed poor animal. "Dropping after calving" is of such common occurrence on some holdings that it has been thought to depend on some special conditions existing in certain situations, and even to be of a contagious nature. These conditions are, however, probably the common ones of abundant supply of rich natural or artificial food accessible all the year round. Where pastures are poor, the supply of food short, and cows compelled to exercise themselves considerably in order to obtain the necessary sustenance, comparatively little is heard of parturient apoplexy.

Nature.

While it is generally agreed that the attack depends in some way on the tendency on part of the individual cow to produce rich milk, intensive feeding and lack of exercise during the later stages of pregnancy, opinions as to the intimate nature of the malady have been most varied and often divergent. The frequency of its occurrence and fatal issue have secured for this affection a very large share of consideration from those whose special relation to it has been concerned in providing means of prevention or cure. Indeed, it would not be an easy matter to point to a disease of the domesticated animals the elucidation of the nature of which has engaged more of the thought of the cow-keeper and the veterinary surgeon. Theories innumerable have been advanced, some have been generally accepted, and held the field for varying periods. The present occasion is not appropriate for the recital of the various views set forth, but until some fairly correct ideas of the true nature

of any disease are ascertained, the application of preventive or curative measures is not so likely to accomplish the object in view. Among the more generally received theories it may be of interest to make passing reference to some of the most prominent. The term "milk fever" is usually in the lay mind associated with the idea that a sudden cessation of the secretion of milk in the udder causes "milk to fly about the system" and set up fever. Of course, this vague idea so expressed has no foundation in fact, or the support of any reliable evidence, but it is a little remarkable that milk secretion, as the source of the trouble, should have pointed to the udder, and that after this earliest and crudest of theories has been long discarded it should be most generally held to-day that the mischief commences here.

By the student of medicine the symptoms of the affection have been almost invariably attributed to disturbance of the functions of the brain. The principal theories connected with this disturbance with interference with the circulation of the blood there. At one time it was held that the great pressure exercised during delivery on the blood vessels of the abdomen, etc., caused an overfulness of those on the brain, and that the symptoms of "parturient apoplexy" were due to their congestion or rupture. Another theory maintained that the withdrawal of the calf allowed a large quantity of blood to rush back into the vessels of the abdomen, thus diminishing the amount in the vessels of the brain and inducing the state known as "cerebral anæmia," a condition which produces the symptoms of fainting.

These views were followed by others, which accounted for the symptoms by the alleged presence of globules of fat, or air in the blood, which blocked some of the blood vessels of the brain. Those who regarded the malady as a true apoplexy believed that in cows whose udder cells became rapidly fatty, and appeared in the rich milk, the blood vessels of the brain underwent a change known as fatty degeneration, and ruptured as a result of the pressure on the vessels of the abdomen during parturition. Though each of the above-named views have failed to stand the test of scientific enquiry or careful observation, it is perhaps worthy of remark that reports in lay and professional journals as to the effect of treatment based on these several views appeared at the time to give colour to their correctness. Indeed, a careful study of such reports published by the votaries of the several theories inspires one with a high degree of caution as to acceptance of the dicta of reports concerning any reputed panacea.

Up to a recent period most of the so-called scientific theories had preferred to account for the symptoms on the grounds of mechanical interference with the circulation of the blood in the brain. About 15 years since views of a new kind were advanced. These attributed the symptoms to the effect of poisonous substances formed in the womb, absorbed into the blood, and carried to the brain. This suggestion that the symptoms resulted from some form

of poisonous substance is certainly more in accord with the course of events than any previously promulgated theory, but unfortunately treatment directed to cleansing the womb and passages by washing them out with disinfectants failed to effect the desired cure, and this view was abandoned.

In 1897, Schmidt, a Danish veterinary surgeon, published an article concerning the cause and cure of "milk fever." According to this authority the symptoms depend on the effect on the brain of a poisonous substance or toxin formed in the udder, and his treatment is directed to antagonise the poison and prevent its formation. It may, however, be necessary to state that the toxin or poison believed to be formed in the udder of the affected cow is hypothetical. It has not yet been demonstrated, and nothing is known of the ultimate conditions on which its formation depends, or of its nature, except that which is assumed to be its effect on the cow. By some scientists it is held that the formation of the poison is materially influenced by conditions existing in the womb, while others deny the existence of any poison, and attribute the results of "Schmidt's" treatment to the mechanical action of distension of the udder. Unlike other theories previously advanced, it appears to be supported in the most desirable fashion by the effects of treatment, and readers of this article will naturally be less concerned with a study of the nature of the malady as interpreted by Schmidt than with a description of his treatment, the success of which more than 10 years' experience has proved superior to any previously adopted. Perhaps, even now, the most it is safe to say about the nature of "dropping after calving" is that its symptoms are apparently due to a poison acting on the brain, and that theoretically this poison is formed in the udder, or as a result of some special circumstances associated with it—that it is really a form of intoxication. It has, indeed, been proposed to call the disease "Parturient Toxæmia," or "Parturient Intoxication."

Symptoms.

Those of the typical stage, when the cow is lying down unconscious, with the head turned back to the side, etc., are so familiar as to render any detailed recital unnecessary. It is, however, a matter of some importance that the earlier symptoms should be recognised, as the effect of curative treatment is more certain and rapid when adopted in the earlier stages. Symptoms may manifest themselves within an hour or two of the birth of the calf, or be delayed for several days, some writers having recorded cases occurring months after parturition, and Schmidt refers to success of his treatment in a case manifesting itself $5\frac{1}{2}$ weeks after delivery. Symptoms indistinguishable from those occurring after calving have been frequently observed previous to the event, some immediately, others several days preceding it, and occasionally the calf has been successfully removed from the cow in the

unconscious state, the mother recovering and rearing her offspring. In the great majority of instances, however, the symptoms show themselves within three days of delivery. As a rule, the earlier after calving the attack develops the more severe it is likely to be. Symptoms first shown after the third day from parturition are usually of a mild type; indeed generally speaking the longer an attack is delayed the better the chance of recovery.

It has been very commonly observed that attacks of this affection are usually preceded by an easy calving, and by discharge of the "after-birth." Symptoms sometimes show themselves suddenly and distinctly, and follow each other rapidly, so that without previous warning a cow may be found lying down in the typical position and unconscious. Such cases often terminated fatally in course of a few hours. In many cases, for some little time before "dropping" there is observable an unsteady gait, swaying in walking, "paddling" in the stall, a strange, vacant, staring appearance of the eye, and other peculiarities, sooner or later followed by loss of consciousness and the power of voluntary movement. Snoring is usually regarded as a bad symptom, often indicating the early approach of death. The course of the disease in the untreated animal varies considerably, but within somewhat narrow limits. It may prove fatal within a few hours, or last a few days. In non-fatal cases, convalescence is usually established in a short time, and in the majority of cases it goes on uninterruptedly, but in some there may be several relapses and recovery, or death may finally ensue. In favourable cases recovery to general good health is rapid.

The disease may attack the same cow several times during her life. We know of an instance in which a cow became affected after each of two successive calvings, escaped after the next, and "dropped" again after the next, on each occasion making a good recovery.

Treatment.

All other aspects of this subject have, however, been deprived of much of their former interest and concern by acquisition of the power of arresting the course of the disease by remedial measures. In the past the form of treatment has been moulded on to the theories as to the cause and origin of the symptoms, and these have often been heroic of their kind. Bleeding was at one time extensively relied on. Youatt, writing 70 years ago, advocated the "free use of the lancet," and says "the small bleedings to which some have recourse are worse than inefficient." This practice has fallen through, probably not so much because it was admitted to be without benefit, as that the operation of bleeding has generally fallen into disfavour. It is still occasionally practised in cases of this affection. The large purgative dose of Epsom salts with croton, treacle, etc., still has its adherents, and though the huge potion of alcoholic stimulant, in the form of a bottle of whiskey, is

less frequently than formerly passed down the throat of the unappreciative cow, its use is not entirely discarded. While these means have failed to accomplish all that was desired, and while it must be admitted that in their administration not infrequently complications have been set up, such action, as they were intended to excite, is, even in the present view of the nature of the disease, in the right direction, though a return to their exclusive use cannot be advocated. Both bleeding and purging tend to lessen the dose of poison in the system, and the depression of the heart, often a feature of the disease, might be overcome by the stimulant.

In considering acceptance of reports of the success of any new treatment, one is probably influenced by past experience. A little more than a dozen years ago a panacea for parturient apoplexy proclaimed far and wide in lay and professional journals was a large sedative dose of a mixture of *chloral hydrate and bromide of potassium*, in favour of which came reports of wonderful cures from all parts of the country. Like that of many of its predecessors and contemporaries, its high reputation was short-lived.

The treatment in favour at the present time is that introduced by Schmidt, and is based on his theory of the nature of the malady. It is directed to counteracting the poison or preventing its formation in the udder. There need be no hesitation in asserting that its success as a curative measure surpasses—indeed eclipses—everything which has preceded it, and robs the disease of its greatest terrors.

The recorded results of the Schmidt treatment vary in a slight degree, but extended over a wide field for prolonged periods they certainly indicate that with this method we become possessed of the means of practically averting the serious losses formerly attributable to this fatal disease. Statistics compiled in Denmark in 1898 showed that of 1,701 cases treated by Schmidt's plan 1,407, or 82·7 per cent., completely recovered. Shortly after the publication of these figures, reports were forthcoming from various European countries and America. Those from Germany were practically the same (82·68 of recoveries), others indicated a slightly lower proportion of recoveries.

The form of treatment yielding the above good results consisted of the injection of a solution of iodide of potassium with atmospheric air through the teats into the udder, followed by massage or kneading, so as to bring the iodine solution into contact with all the milk-secreting parts of the gland. For some time it was thought that this drug possessed some specific power of counteracting the poison or preventing its formation. A veterinary surgeon in the West of England, mistaking the word "gramme" in the original prescription for "grain" met with unwonted success by injecting less than one-fifteenth of the dose prescribed by Schmidt, continued to use a solution of this strength for a considerable period before discovering his error, which was first pointed out to him after he published the successful results of

his treatment. It was also narrated that a Continental veterinary surgeon, happening to be at a farm when a cow was attacked, immediately injected into the udder a considerable quantity of boiled water, intending as soon as he could obtain some iodide of potassium to use it for a second injection, but on his return to do this he found to his surprise his erstwhile patient up and eating. In other cases, too, the injection of large quantities of boiled water has proved effective in dispelling the symptoms. In a considerable proportion (10 per cent.) of cases so treated it is alleged the cows have become permanently dry.

Injection of a solution of iodide of potassium into the veins or under the skin, large doses by the mouth, and rubbing the udder of the affected cow with iodine ointment, have each been followed by recovery, while in many successful cases other drugs have been substituted for the iodide.

More recent experience has shown that forcing air into the udder through the teats by means of a modified ball syringe is followed by an increased proportion of recoveries. Out of 914 cases treated in this way, 884, or 96·7 per cent., recovered completely; 12 died or were slaughtered during the course of the disease; while in the cases of 12 others slaughter at a later stage was necessitated by some complication as paralysis, torn muscles, pneumonia, mastitis, etc.

At the present time oxygen is being employed instead of air as an injection into the udder, and according to some practitioners the results are even more favourable than those quoted above. Special apparatus for generating and forcing the gas into the udder are now available.

The earlier in the course of the disease any of these forms of the treatment are applied, the better is the chance of the animal's early recovery. Patients may be expected to rise up within a few hours after the injection; though this occurs sometimes after the lapse of only three-quarters of an hour, it may be delayed for as long as 50 hours, but probably the average over a large number of cases would be about 6 hours. It may be found necessary to repeat the treatment three or four times at intervals varying according to the condition of the patient. The normal yield of milk is usually established in about a week after the cow gets up.

Though the proportion of recoveries above recorded is so preponderating, and this form of treatment has apparently placed the disease largely under our control, a critical analysis of published and unpublished experiences shows that the operation carried out by some individuals is much more successful than those of other operators, *e.g.*, in one report of 1,750 cases it is shown that in two cases only was there any permanent diminution in the yield of milk, while in another, 10 per cent. of the cows treated became permanently dry.

There is often considerable depression of the heart of the affected cow, and in very many of the successful cases following

injection of air it has been deemed advisable to inject under the skin a dose of some heart stimulant, as caffein or strychnine. Occasionally one of these or other alkaloids is mixed with the solution or pumped with air into the udder, or given as an enema.

Under all circumstances, great care must be exercised to secure absolute cleanliness throughout the operation. This applies to the teats, udder, apparatus and operator. Micro-organisms introduced into the interior of the udder may establish inflammation, with consequences we know to be serious. As a useful precaution a clean towel may be placed under the udder. When injecting air, it is usually deemed advisable to pass it in through cotton wool, or to cause it to bubble through a solution of iodide of potassium.

If iodide of potassium is used as an injection into the udder, air should afterwards be pumped in, so that a sufficient degree of distension is produced. It is not necessary to thoroughly strip the udder, as the iodide solution readily mixes with milk, and the subsequent massage of the udder disperses it throughout the gland, a condition of considerable importance, but not always an easy matter to carry out when the cow is lying down. The patient should not be milked for some hours after rising, and it is regarded preferable that the udder should not be "stripped out" for two or three days.

The adoption of this treatment does not absolve us from carrying out those measures for the comfort and safety of the patient which have always occupied our attention. Happily, she is usually on her feet before most of the ill-effects of lying down would be manifest, but when necessity arises, the cow should be kept in proper position to avoid becoming "blown." If the head is allowed to hang down, matters may regurgitate from the stomach and pass down the windpipe, causing lung trouble, etc. It must be remembered that there is always a degree of danger connected with administering medicines, gruel, etc., by way of the mouth to an unconscious animal.

Prevention.

Notwithstanding the varying and even divergent opinions as to the precise nature of the malady, it has been long realised that it is to a large extent preventable, by keeping cows, during the last five or six weeks of pregnancy, on "short commons," and enforcing a moderate amount of exercise. Turning them on to bare pastures, in which it is necessary for them to "work for their living," represents what is best from their point of view, and though it may not be claimed that this or any other measure at our disposal will afford absolute security, but few cows so kept fall victims of the disease. Such treatment is, of course, not always practicable, though it may possibly be imitated in case of housed cows by withholding fat-forming food, and turning them out for some hours daily. From a practical point of view, this mode of preventive treatment is open to the serious objection that the milk yield of

cows so treated is much less after calving, and though with a liberal diet this may be materially increased, the total yield for the year often falls considerably short of what it would have been had the cows "come in" with a good "show." Indeed, the great success of the treatment described renders it questionable whether it will not be more economical to allow all cows to calve at their best and run the risk of a portion "dropping," a risk which, by adoption of Schmidt's method, is shown to be 95 to 1 in favour of recovery.

THE MIDLANDS DAIRY CONFERENCE.

Never before have the Dairy Conferences—the first of which was held in Cheshire in 1885 and continued each year until now—with but one exception (1900) been of such a business character with widespread interest, yet combining a fair amount of pleasure.

The following is a table showing the districts which have been visited in previous years, and the President at each :—

YEAR	DISTRICT OF CONFERENCE	PRESIDENT
1885	Cheshire	Lord Vernon.
1886	Derbyshire	Lord Vernon.
1887	Ireland	Viscount Powerscourt, K.P.
1888	Eastern Counties (Norfolk and Suffolk)	Marquis of Bristol.
1889	Scotland	Earl of Galloway, K.T.
1890	Yorkshire and Durham	Marquis of Ripon, K.G.
1891	Channel Islands	Viscount Middleton.
1892	Cumberland and Westmoreland	Lord Brougham and Vaux.
1893	Somersetshire	Earl of Cork and Orrery, K.P.
1894	Switzerland	Earl of Cork and Orrery, K.P.
1895	Lancashire	Earl of Derby.
1896	North Wales	Earl of Powis.
1897	Denmark and Sweden	Sir James Blyth, Bart.
1898	Devon and Cornwall	Earl of Mount Edgecumbe.
1899	Ireland	Count Moore, M.P.
1900	<i>No Conference.</i>	
1901	Scotland	Lord Tredegar.
1902	Home Counties (Berks, Bucks, and Oxon)	Earl of Warwick.
1903	France	Sir Edward Strachey, Bart., M.P.
1904	Nottingham	Earl of Crewe, P.C., D.C.L.
1905	Channel Islands	Lord Northbourne.
1906	Shropshire	The Marquis of Winchester.
1907	Kent and Sussex	Lord Kenyon.
1908	Midlands (Derbyshire and Staffordshire)	Sir George Barham, J.P.

It will thus be seen that Derbyshire was visited 22 years ago, and many of those who took part in the proceedings then were able to relate to those taking part in the 1908 Conference for the first time their experiences on the previous occasion.

Fully cognisant of the great impetus that would be given generally to the Dairy Industry by inviting Kindred Societies to send delegates to join in the deliberations over the papers to be read at the Conferences, the greater weight any resolutions which might then be arrived at over the discussions would have when forwarded to the respective Government departments, invitations

were issued, and resulted in the following Societies sending representatives, viz. :—

British Dairy Farmers' Association.
Alfreton and District Dairymen and Cowkeepers' Association.
Birmingham and District Dairymen's Association, Limited.
Bucks Dairy Farmers' Association.
Cardiff and District Dairymen's Association.
Coventry and District Dairymen's Association.
Dairy Students' Union.
Dairy Trade and Can Protection Society.
Derby and District Dairymen's Association.
Derbyshire Dairy Farmers' Association.
Eastern Counties Dairy Farmers' Co-operative Society, Limited.
Federation of Dairymen's and Cowkeepers' Association of the United Kingdom.
Gloucester, Somerset, and Bristol District Dairy Farmers' Society.
Land Agents' Society.
Leicestershire Agricultural Society.
Lincoln Farmers' and Dairymen's Association.
Midland Farmers' Association.
North Western Dairymen's Association.
Nottinghamshire Agricultural Society.
Portsmouth (Borough of) Dairymen's Protection and Benevolent Association.
Somerset, Wilts, and Dorset Farmers' Association.
Staffordshire Farmers' Association.
Utttoxeter Agricultural Society.
Whitchurch Dairy Farmers' Association.
Yorkshire Federation of Dairy Farmers' Associations.

Members and delegates to the number of 120 assembled at Derby on the evening of Monday, June 15th, at the three hotels selected—viz. : the Royal, the St. James's, and the Midland Station Hotel—where accommodation had been reserved for the party, which included the following prominent persons connected with the dairy industry, viz. :—

Sir George Barham, J.P., President ; Mr. W. C. Brown, Chairman of the Conference Committee ; Mr. Cecil G. Argles, Ampthill, Beds. ; Mr. and Mrs. Arthur S. Barham, Hampstead, Middlesex ; Mr. Geo. J. Bell, Wigton, Cumberland ; Mr. Alfred Berry, Sudbury, Suffolk ; Mr. and Mrs. J. F. Blackshaw, Kingston, Derbyshire ; Mr. Simon Blore, Rugeley, Staffs. ; Mr. F. Bostock, Coventry ; Miss Martha Brown, Hutton, Lanes. ; Mr. John Brown, Tunbridge Wells, Kent ; Mr. C. Burnett, Burton-on-Trent ; Mr. and Madame Camillo Cerruti, Italy ; Mr. Vernon B. Chalk and Miss Chalk, Beckenham, Kent ; Mr. George H. Chamberlain, Alfreton ; Mr. A. C. Coates, Hillesden, Bucks. ; Mr. N. Coates, Hillesden, Bucks. ; Rt. Hon. Jesse Collings, M.P., Edgbaston ; Mr. George Cooke, Clayley, Chester ; Mr. W. P. Cowell, Saffron Walden ; Mr. W. J. Cox and Miss Cox, Cardiff ; Mr. A. E. Crook, Wilts United Dairies, Ltd. ; Mr. Loudon M. Douglas, Edinburgh ; Mr. Dumbrell, Portsea, Hants ; Mr. G. H. Elliott, Bingham ; Mr. W. Elliott, Middlesex ; Mr. J. B. Ellis, St. Ives, Hunts. ; Mr. George Evans, Alfreton ; Mr. R. Finney, C.C., Hemington, Derby ; Mr. and Mrs. Thomas Gibson, Barnet, Middlesex ; Mr. F. W. Gilbert, Swarkestone ; Mr. Wilfred Glover, Lutterworth ; Mr. J. Gough, Buckingham ; Mr. J. L. Green, "Rural World," London ; Mr. A. Hailwood, J.P., Manchester ; Mr. J. F. Harrison, Buckingham ; Mr. W. T. Harrison, Birmingham ; Mr. E. Hart, London ; Mr. H. Heald, Derby ; Mr. H. Heath, Arnold ; Mr. F. Helliings, Croydon, Surrey ; Mr. F. Hibbert, Lincoln ; Mr. W. Higgins, London ; Mr. T. L. Hitchen, Nantwich ; Mr. J. T. Horner,

London; Mr. Chas. Ibbott, Oakley, Beds.; Mr. T. C. S. Johnston, Bury St. Edmunds; Mr. W. H. Key, Enderby, Leicestershire; Mr. C. Sneyd, Kynnersley, Uttoxeter, Staffs.; Mr. A. O. Lakin, Whitechurch, Salop; Mr. Wm. Langridge, Eastbourne; Mr. Stephen Lamsley, Bournemouth; Mr. S. H. Latham, London; Mr. John Lee, Ellesmere; Mr. F. J. Lloyd, F.C.S., London; Mr. Robert Long, Shefford, Beds.; Mr. J. Longbottom, Halifax; Mr. J. Longwill, Oakham; Mr. John Lovatt, Uttoxeter; Mr. Archibald MacNeillage, Editor of "Scottish Farmer," Glasgow; Mr. W. E. Manchester, "Dairy World," London; Mr. Archibald McConnell, Southminster, Essex; Mr. Primrose McConnell, Southminster, Essex; Mr. Christopher Middleton, Darlington; Dr. Thomas Milburn, Kingston, Derbyshire; Mr. Milner, Bradford; Col. J. H. Monekton, Warwick; Mr. A. J. Mullins, Ansford, Somerset; Mr. and Mrs. Thos. Nuttall, Uttoxeter; Mr. J. M. Oubridge, Newcastle-on-Tyne; Miss Park, South Leverton, Lincs.; Mr. Frank Parkin, Nottingham; Mr. Thos. H. Pearce, Bristol, Somerset; Mr. Jas. Peart, Hatfield, Herts.; Mr. Philip Peters, Tunbridge Wells, Kent; Mr. E. H. Phillips, London; Mr. H. P. Prince, Uttoxeter; Mr. Joseph Popple, Brigg, Lincs.; Mr. and Mrs. Charles Robinson, Marton, Yorks.; Mr. and Mrs. J. C. Robinson, Lewes, Sussex; Mr. Jas. Sadler, Crewe; Mr. J. W. Sanders, Lutterworth; Professor J. P. Sheldon, Buxton; Mr. A. Silk, Coventry; Mr. W. Ellaway Smith, Uttoxeter; Mr. Edwin Smithells, Stafford; Mr. Geo. Stephenson; Mr. George Stevenson, Eastbourne, Sussex; Mr. Thomas Stone, London; Mr. D. E. Thomas, Editor of "Farm and Home"; Mr. F. H. Thornton, Northampton; Mr. and Mrs. C. F. Thwaite, London; Mr. and Mrs. Alec Todd, Kingston, Derby; Mr. Sidney Villar, F.R.C.V.S., Harrow, Middlesex; Mr. A. G. Voller, Portsea, Hants; Alderman Richard Waite, J.P., Duffield; Mr. Eldred G. F. Walker, Bristol. "Western Daily Press and Live-Stock Journal"; Mr. and Mrs. W. J. Wedd; Mr. John Welford, London; Miss Maud White, Beckenham, Kent; Mr. and Mrs. Frank J. Wigmore, Oxford; Mr. A. Ireland Wright, Newcastle-upon-Tyne; Mr. T. Wood, Stafford; Mr. F. E. Harcastle, for the Secretary.

That same evening Sir George Barham entertained a number of representatives of the Agricultural and Dairy Press to a banquet at the Royal Hotel, which had been provided by him. Sir George in his opening speech proposed "The King," which was duly honoured, and explained the objects of the British Dairy Farmers' Association, which was founded in 1875, and is honoured by the patronage of His Majesty The King, who as Prince of Wales graciously received the members at Sandringham on the occasion of the Conference in the Eastern Counties in 1888. It was twenty-three years ago when these Conferences were started. He pointed out the usefulness of the Society in doing everything possible to promote the interests of the dairying community, and to the part they had taken in securing moderate railway rates. There was the British Dairy Institute at Reading, which was the first dairy Institute in the country, where hundreds of students had been trained in the theory and practice of dairying in all its branches. But he regretted to say it, although the opportunity was a fitting one, that the reports which often appeared in the press relating to matters connected with the supply of milk were often such as to cause misinterpretations to be placed upon them by the public at large, and he hoped that those present there would do what they could to assist that Conference and the dairying industry to place their views fully before those who were interested in such matters.

Sir George also alluded to the rapid improvements in dairy appliances and to the impetus given to such through the Society offering prizes for implements and improvements in connection with the Annual Dairy Show at Islington. Mr. John Burns had promised to bring in a bill on the subjects of tuberculosis in cattle and with regard to the inspection of cowsheds, and hoped that all that was said at this Conference would be of assistance to Mr. Burns. It was much better he should have the information beforehand rather than that the Society should take the part of critics after the bill had been introduced in Parliament.

The representatives of "The Times" and "The Daily Telegraph" responded.

On Tuesday morning the visitors were astir early, and all flocked to the Guildhall, where the Mayor of Derby (Alderman Simpson, J.P.) and a large number of local farmers and dairymen extended a cordial welcome to the Association.

The Mayor said there were advantages attaching to the central situation of Derby and to the conditions which make the surrounding districts an ideal dairy county, and he considered it was a most suitable selection for a Dairy Farmers Conference. He was not connected with the dairy industry himself as a means of livelihood, but he understood that with the decline of other branches of agriculture the milk industry had become a veritable stronghold of agriculturists, but science and law required new and up-to-date methods of production. Referring to co-operation, he said quickness of transit on land and sea against open competition had entirely changed the farming industry, and this meant that the man at home could hope to succeed only by keeping abreast of the times. Although the production of cheese had very considerably decreased, and cattle raising he understood was unprofitable (remarks which caused a few to smile), the one stronghold left to farmers was the milk supply, but the production of milk would not meet with much success unless up-to-date methods were adopted. The farming class comprised a straightforward set of men, but could they look with complete satisfaction upon the many and expensive alterations suggested by professional men in order to promote a clean and pure milk supply? Everyone desires to protect public health, but he thought the great expense entailed by these suggestions should not be borne entirely by the farmers. To enforce these suggestions Acts of Parliament were multiplied, although it might be said this was not peculiar to the farming industry, but applied to other industries as well, and they had to face bare facts, that new legislation was coming along to deal with the supply of milk, so that farmers needed such an organisation as the British Dairy Farmers' Association to watch their interests, and he urged the combination on the part of all concerned in that important industry, so that their views might receive full consideration at the hands of the legislature which such were entitled to receive, and to enable those concerned to combat all unreasonable proposals. To

combine in these days in their profession, no matter what it might be, was a necessity for their own self-protection. Providing the Society was a strong one, and knew exactly what it wanted, they could depend upon it the Government would listen to them and accede to their demands. He urged each member to do more than pay his annual subscription. Resolutions and suggestions of an Association were generally listened to with favour by the Parliamentary Committees. Concluding, he again welcomed the party most heartily to the town and county of Derby, and expressed the hope that the Conference would be attended with good results to the benefit of the public and the farming industry.

Mr. John Pakeman, J.P., President of the Derbyshire Agricultural Society, also welcomed the Conference on behalf of that Society. He said the county was chiefly famed for the excellence of its Shire horses and its dairying, and, in addition, to the warm-heartedness of its inhabitants. The Society he represented would be with the British Dairy Farmers' Association in trying to remedy any grievances or difficulties which might arise through the attention of the legislature. They were second to none in their determination that a plentiful supply of milk should be supplied at a reasonable price.

Sir George Barham (President) thanked the Mayor for the welcome he had extended to members of the Conference. The Mayor must not be surprised if after his office had expired he was elected President of the Conference next year. He thought while he listened what a good President of the British Dairy Farmers' Association he would have made. Several points of importance had certainly been urged upon those present, particularly as regards the necessity for combination, and such words were very encouraging. Sir George also thanked the Corporation of Derby for granting them the use of the civic headquarters for their deliberations on this second occasion. Sir George also thanked Mr. Pakeman for the welcome he had spoken on behalf of the Derbyshire Agricultural Society. He remembered Mr. Pakeman as one of the few present who assisted in welcoming the Conference party on the occasion of its previous visit to Derby. He especially recalled the welcome given on that occasion: the appreciation, hospitality, and kindness they received at the hands of the late Col. Coke and the late Lord Vernon. Other old Derbyshire friends who he was glad to see present were Mr. Finney, Mr. Nuttall, and Professor Sheldon. Sir George thought they could not have selected a more suitable place than Derby, which was the centre of one of the best dairying districts in the kingdom. In conclusion, he said they were threatened with legislation which would affect landowners, farmers, and the dairying industry throughout the country, and they had to decide on the stand to be taken in the matter. If the proposals were allowed to be carried out as at present suggested, it would affect them not only in their daily lives but in their pockets. He considered the Conference ought to pass a resolution calling upon

Mr. John Burns to make the expenses of inspectors and officials to be appointed under these Acts payable out of the Imperial Funds, and not out of the County rates. (Applause.)

The Mayor then withdrew in favour of the President.

Sir George, before proceeding with the business of the Conference, referred to the grief and shock occasioned by the death of Lord Derby, a former President of the Association, and a Vice-President for the last 12 years, and he moved a sincere vote of condolence with Lady Derby and family, as follows:—"That the British Dairy Farmers' Association, assembled in Conference at Derby, records its deep sense of the loss sustained by the death of the Right Hon. Earl of Derby, and expresses its sincere condolence with the Countess of Derby and the family in their bereavement." This was carried unanimously.

Sir George also read a letter he had received from the Secretary of the Association (Mr. Wm. C. Young) regretting inability through his serious illness to be with them during the proceedings. Sir George thought that if a letter of sympathy was sent from the Conference to Mr. Young it might reach the sick room, and do a great deal to help him through his illness if he knew how they missed his presence after the 23 years continual attendance and interest for their comfort he had shown at such gatherings.

This was seconded by Mr. W. C. Brown, the Chairman of the Conference Committee, and carried unanimously.

The first paper in the programme was then read, viz.:—

MILK-SELLING FARMERS AND COMING LEGISLATION.

By Professor J. P. SHELDON, The Brund, Sheen, Buxton.

It seems to some of the older ones among us that remarkable changes have taken place in the Dairy World since the formation of the British Dairy Farmers' Association, now close upon one-third of a century ago. Within recent years we have apparently drifted into a period of legislative and administrative activity that makes us feel, somehow, as if we know not where we are, or where we shall be in the middle of next month, or of next year.

The legislator is on the alert against infant mortality in the slums, much of which—he has been led to conclude—must be owing to milk yielded by presumably tuberculous cows in the country. And the Inspectors under the Food and Drugs Act, and Medical Officers of Health in urban districts—a disciplined army of them—are on the war-path, looking out for delinquent dairy farmers and dishonest milk-sellers everywhere, leaving no stone unturned that may have water under.

Need of Official Vigilance.—We are bound to admit that ample need exists for the vigilance of officials, part of whose duty lies in guarding the public against dishonest purveyors of adulterated or otherwise perverted milk; or of any other kind of food, liquid or solid. With regard to liquids for human swallowing, there is a large scope for exercise of all administrative vigilance and energy that may be necessary to save the public from being defrauded, and all enlightened dairy farmers wish success to these efforts. It may perhaps be desirable that we should look first into some of the alleged delinquencies of an uncertain but small percentage of milk-selling dairy farmers before we formulate any conjectures as to what legislation is likely to do for them in the near future. The trade in country milk, as we know it now, is quite a modern evolutionary development. It is necessarily modern, because it was impossible not only before we had railways at all, but also before we had plenty of railways, and sufficient railway managers who could discern a good thing for themselves in a daily—an almost continuous—traffic in country milk for the use and benefit of dwellers in urban districts.

Growth of the Milk Trade.—Once its suitability to modern conditions of urban life had been proved, this milk trade was not a thing of slow growth. Away back in the early seventies it was then expanding, not with leaps and bounds, but with that kind of steady and quiet, but powerful, progression that is so much more reliable than leaps and bounds. And with this constantly growing movement came also a sense of the vast importance of the new trade to the health of children born and immured within the bounds of great centres of population. Also the beginnings of sanitation were roughly contemporaneous therewith, following which the science of health became an inevitable study—a science whose future is one of great potentiality.

These developments have led up to the state of affairs current now in the stupendous and still growing milk trade of England, a state which is not quite as satisfactory as it might be, and as we may venture to hope it will be within measurable time. There are exaggerated charges nowadays on the one side, and—as a natural corollary—wounded feelings on the other, and the whole situation is permeated by a sort of reciprocal regard which leaves plenty of room for improvement.

Libelling Milk.—Take, as an example, the persistent charge brought by officials here and there, by certain journalists, by men who ought to know better, and, indeed, who do know better, that milk from the shires is responsible for much, if not all, of the infant mortality from tuberculosis (or phthisis) that occurs in urban districts, chiefly in those that are most thickly crowded by human beings. It is obvious that such a charge as this is calculated to do enormous mischief in more than one direction. It is equally obvious that such a charge ought never to have been made if any uncertainty exists as to the truth and justice of it. And yet this charge—if I

may use an emphatic expression of someone else's—has been repeated with such “damnable iteration” that many good people have become somewhat nervous on the subject. These officials are silent about the numberless infant lives which milk from the country has saved from destruction.

Here is one of the points in dairying on which we may expect drastic legislation in the near future, viz., that of bovine tuberculosis, on account of its alleged transmissibility to children. In view of this question, we may ask how it occurs that no such transmission takes place to children in the country?

Well, let us have legislation by all means, if only it shall be properly applied when we get it. Very much depends on methods of administration, as the sequel to legislation. The legislation promised will be directed against milk, and those who sell it. But are we quite sure that such legislation is starting at the right end of the business? The avowed object of such legislation as we are led to expect is, primarily, the protection of infant life in towns against tuberculosis, which is alleged to come from the country.

Contaminated Air.—But have the officials concerned in it solved the problem which underlies the infection to which these town-bred children are so unfortunately liable? Have they analysed the air of great towns, and especially of the slums therein contained? Were they to devote to this potent source of contamination one-half of the scrutiny they have given to milk, it is more than probable that their eyes would be opened to a different phase of the question. Whatever the microbes may be that contaminate this air, the fact of contamination is easily perceptible by any person from the country inhaling the foul air into his lungs. Just imagine infants born into such a world of streets and houses, drawing in with their first gasps such an air as that. Imagine, too, these puny items of unlucky humanity doomed to go on breathing such air for weeks, and months—if they can manage to exist so long.

Tuberculous and other infections or contagions, one or both, form the crux of the whole thing; and this infectious air will, when adequately investigated, in all probability be found to be more in fault than any supply of milk from the country. How long can pure milk remain pure in such air, exposed to it in jugs and basins themselves contaminated by the reeking effluvium of these crowded dens—milk, which is one of the most complex and sensitive of fluids, and a ready absorbent of whatever the air resting upon its surface contains?

Speaking of contaminated air in cities and uncontaminated air in the country and on mountains, Dr. Ed. von Freudenreich remarks, in a most interesting little book of his called “Dairy Bacteriology”: “In the streets of Paris there are on an average 4,000 bacteria per cubic yard. At Berne, I have found about 700 in the same space. In open country fields I have found about 100, and on a small mountain near Berne not more than 8 per cubic yard.”

At the top of the Eiger mountain (13,000 feet) he "found the air absolutely free from bacteria."

These bacteria in the air are of many kinds—beneficial to health, harmless, or fatal, as the case may be; fortunately the vast majority are either beneficial—indeed, necessary to health and life as we know it—or harmless. But what about the germs of tuberculosis with which the air of thickly populated towns is so dangerously impregnated? How can the tender lungs of infants born in the midst of them resist and throw off the virus of infection?

It would seem, therefore, reasonable enough to suggest that as milk consumers constitute the most important factor in this great question, so they form the end at which legislation ought to begin; or, to say the least of it, they form one of two ends, the other being represented by producers, namely, farmers, whilst the dealers—the middlemen as they are called, correctly enough—form the centre where the two ends come, as it were, into the contact supplied by a connecting link. It seems, therefore, that legislation ought to begin amongst the vast numbers of milk consumers who hang on to life in the narrow streets, and courts, and alleys of populous towns, who exist in an atmosphere so impure that it really needs drawing off twice a day and replacing with fresh air from the pastures where milk is made, not far away, just as water is brought long distances in huge pipes to these self-same towns. The children of the Ghetto want not water only, but air, from the country. The air they breathe is the chief cause of infant mortality, and it contaminates the milk they buy when it is left uncovered and exposed in such an atmosphere.

Sanitation of Cowsheds.—A good deal of complaint has been heard of lately about dirty milk being sent from country to town, and here the inspectors are on ground which is demonstrably sure and true. To those of us who are familiar with dairy farming, it is undeniable that many milk-selling farmers are lamentably and almost criminally weak so far as a sense of cleanliness in cowsheds is concerned. It is true that sanitation is difficult to secure in many old farmsteads. These need reconstruction, or, to say the least, restoration, in regard not only to cleanliness, but also to air-space and ventilation. Dirty milk incriminates him, or her, whose duty is to keep it clean, be he man or master, maid or mistress.

Here, then, are points on which stress is laid for legislation, viz., cleanliness in the milking of cows, sanitation and ventilation in cowsheds, with ample air-space in cubic feet, in order that cows' lungs may always have fresh air with which to inflate themselves.

Quality of Milk.—Now we come to quality of milk, as to which a minimum standard has already been established, viz., $8\frac{1}{2}$ per cent. of solids not fat and 3 per cent. of butter-fat. This standard is not a very high one. Cows giving milk inferior to it are not worth calling dairy cows at all. The average milk of most breeds of cows is a good deal above the minimum standard, and many farmers do not receive an adequate price for such milk as

runs a good deal above the common average. One difficulty which now confronts the dairy farming fraternity is that of securing a fair price for a high-class article. It is said that this difficulty has been met in some cases by artificially lowering the quality of rich milk until it rests at a trifle above the standard. This, if true, is reprehensible; yet, at the same time, there ought to be a good working arrangement established under which rich milk will secure a price above the average.

It is difficult to see how legislation can interfere as to rich milk being adequately paid for, but in any case it can and will secure a supply at least up to the official standard. In point of fact, legislation has already secured this, subject to effective administration of the law.

It is said that something must be done with regard to railway companies. Certain lines do not like to carry milk in locked churns, giving as a reason for their objections that, in case of locked lids, the quantity of milk in a churn cannot be compared and verified with the farmer's consignment note. It is an open secret that railway porters in certain places have developed a fine critical taste in respect to good milk. And it has been suggested that some of the smartest of them should be selected by competitive examination to become inspectors under the Food and Drugs Act, on the principle that "an old poacher makes the best game keeper."

Summary.—Coming legislation, therefore, may be expected on these several points:—

1. The elimination from dairy herds of all cows convicted of being tuberculous, especially in regard to udders.

2. The prevention of milk coming from places where a fever, or other contagious malady of any kind, happens to have manifested itself. In regard to this point, stringent regulations will, no doubt, be strictly enforced.

3. Inspection, by means of surprise visits, of all cowsheds engaged in the milk trade, with the view of securing clean milk.

4. Strict supervision in respect to the sanitary condition of cowsheds, in regard to cleanliness, to ventilation, and air-space, to lighting, to water supply, and to drainage.

5. Lastly, there will be, or ought to be, some legislation in respect to foreign milk coming to us from the Continent. Such milk should be microscopically tested, and that pretty frequently, for the tuberculosis bacillus; for it will appear singular to be so strict with our own milk and to allow that of foreign countries to come in scot free.

The drastic legislation we are led to expect will increase the price of milk, because delinquents will be driven out of the milk trade, and will take to cheese or butter again, and to the rearing of young stock. All up-to-date dairy farmers will meet this legislation with cool heads, for it is they, if anybody, who will derive the

benefit that will accrue from the enhanced price of milk which is tolerably certain to be the sequel of such legislative innovations as are now expected.

Mr. Primrose McConnell (Southminster, Essex), in proposing a vote of thanks to Professor Sheldon for such an instructive paper, remarked that he did not think he had put the matter strongly enough. The greatest difficulty dairy farmers had to deal with was the ignorance displayed by medical officers of health and sanitary inspectors, who knew no more of milk than a sucking pigeon. (Laughter.) Extraordinary measures had been suggested to combat microbes, which were not inimical to health; some were talked about as enemies which did no harm to anybody, and were the common lot of human beings and byres and cows. One medical man had actually suggested that a mackintosh, with four holes for the teats, should be put over the cow; and another gentleman that every cow should be groomed before milking time. As suggested by Professor Sheldon, such officers would be well advised to pay more attention to the places where the consumers in the poorer districts kept the household supply of milk. He had known it to find a resting place against old boots or equally objectionable fish. As to milk from abroad, he was not afraid of it if it was dealt with on the same terms as the home supply. The foreign competitors should be subject to the same regulations as themselves. (Applause.) He did not admit that foreigners knew more about producing milk than they did at home. The man who went alone to Denmark, Holland, France, or Switzerland, and investigated for himself, not as one of a party to a place all prepared for a "show," but on a surprise visit, would not be enthusiastic about the products of those countries. He agreed there are many cowsheds now utilised which were not fit for the purpose, and sadly needed putting in order. But improvements could be easily overdone. The fact remained that the purity of milk could be to a great extent assured with properly constructed cowsheds. As it was a national question, whatever steps were taken by the Government should be at the national expense. With regard to tuberculosis, he pointed out that cowmen and farmers were proverbially healthy, and it was amazing after all they had heard with regard to that subject there was anyone living on the face of the earth. He estimated that only one cow in 500 was affected with tuberculosis of the udder, and this had been borne out by investigations on a large scale. He was one of the first to use the tuberculin test, but he had convinced himself that it did not amount to anything, and had dropped it altogether.

Mr. C. Ibbott (Bedfordshire) seconded the vote of thanks, and in so doing expressed the opinion that new legislation would help those farmers who tried to give a first-rate article at the expense of the vendors of the cheap milk now on the market. He was a

producer and also retailer, and began when twelve years old with one cow, which he milked himself, and now had 100, and endorsed the need for good byres and cleanliness.

Mr. John Coleman (Derby), who said he had had a lot to do with the milk trade in Derbyshire for many years, drew attention to the fact that the paper, like the majority of other papers on the subject, omitted any reference to the deterioration of milk owing to the state of the water cattle drank—an evil too frequently lost sight of. On the previous day in an adjoining county he saw cows standing in a dirty pond drinking water. These cows went straight into the cowshed, and the milk went to London. In such a case, could people wonder at complaints of milk not keeping and not being good? He thought attention should be given to what cows had to eat as well as to the water they drank. When he managed the Kedleston Cheese Factory, contamination was traced to a pond into which drainage found its way, and attention to such matters was very important, and would do more to secure a good supply of milk than all the air space or all the cleanliness in cowsheds they might choose to effect.

Mr. J. F. Blackshaw (Kingston) thought it behoved them to exert themselves, and to instruct the Government as to the producer's position, so that the question might be studied all round, otherwise they would get legislation which would be irksome to them. Dairy farmers were most anxious to supply milk in the best possible state. They should insist that necessary improvements in a tenant's holding should be carried out by the proprietor of that holding, and should see that compulsory powers were given for those improvements to be made. As to an increase in the price of milk, they hoped it would not be such as would bring into existence foreign competition. A slight advance in the price of milk would enable the foreigner to compete in the English market, so it was only fair that legislation enforced in this country should be enforced upon the foreign producer. (Hear, hear.) If this were done the legislation might be as far-reaching as the Government liked, and the British dairy farmer would not need to fear outside competition. He supported the last speaker in his remarks as to the harm done by stagnant water for drinking purposes. Numerous cases had been brought to his knowledge where trouble with milk was through this latter state of affairs.

Mr. W. Elliott (Middlesex) dealt with the question of condensed milk, contending that, whether imported or otherwise, it should clearly set forth on the label the preservative used in its condensation and the amount of water required to be added to it to bring it back to milk pure and simple.

Mr. E. G. F. Walker (Bristol) strongly emphasised the necessity of foreign producers being put on the same level as English dairy farmers, giving instances of the uncleanness he had witnessed in the production of milk abroad. In one case a dairy got its supply of water out of a stream into which a few yards higher up flowed

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the sewage from a piggery. He had heard of cheese being wrapped in the same cloth which had on the previous day covered the pig going to market. Butter blending was carried out under very primitive conditions on the Continent. He thought England a long way ahead of other countries in the matter of hygienic methods connected with the handling of dairy produce.

Mr. F. J. Lloyd, F.C.S. (the Society's Consulting Chemist), sought to show that the milk supply did not produce that amount of disease which was generally attributed to it. Dr. Newman, in his investigations into infants deaths from diarrhoea, found that 50 per cent. were not fed on cow's milk at all, but on condensed milk and other foods. If they wanted to stop infantile mortality it would not be done by legislation affecting the milk, but by legislation which would purify the atmosphere of the towns. Anyway, he spoke in disapproving terms of condensed milk, which was generally free from germs while it remained sealed, and any germs would be destroyed in the process of condensation, and advised consumers to at all times to keep milk covered over. People took care as a rule to keep a cover on the hot-water jug, why not on the milk jug in the same way? He was one of the few men in England who believed that tuberculosis in cattle had nothing to do with the disease of the same name in human beings. (Applause.) Assuming that Dr. Koch's latest declaration on the subject was correct, the position was that six per cent. of deaths were due to tuberculous milk, and 94 per cent. due to other causes. There has never been a single case of tuberculosis of the lungs which could be proved was due to bovine tuberculosis.

Mr. Jas. Sadler (Crewe) spoke as to the varying quality of the milk given by the same cow, and the impossibility of fixing a standard or limit of quality to serve upon all occasions, and strongly protested against a remark in the paper that a cow which gave less than 3 per cent. of butter-fat was not worth calling a dairy cow at all. If that were so, a cow might be taken out of the dairy to-day as unfit and would to-morrow be placed back as a very excellent cow.

Mr. A. Hailwood (Manchester) thought that relatively twice the sum was paid for condensed milk, judged by its nutritive constituents, as compared with fresh milk.

Mr. Heath (Bestwood) supported the remarks by saying that such legislation should be passed as would protect honest men.

The President said they hoped to receive during the progress of the Conference the views of those taking part to enable them to pass resolutions which could be sent to the Local Government Board and the Board of Agriculture voicing the many important questions before the Conference. One of those questions was that of condensed milk. It was a remarkable fact that nearly all the legislation of this country was carried out for the benefit of the foreigner.

Professor Sheldon expressed his thanks, and said he had taken an interest in the Association since 1876. He agreed with Mr. Sadler that he was not precise in his statement that cows giving milk inferior to the standard were not worth calling dairy cows. He stuck to his opinion. As to the variability of cow's milk, he considered the question a difficult one, and for that reason he did not agree with the fixed standard. He thought he might take a little credit to himself from a literary point of view if there was only that one mistake in his paper.

The vote of thanks to Professor Sheldon having been cordially endorsed, the company adjourned to their respective hotels for luncheon.

The Conference resumed its sitting in the Guildhall in the afternoon at 2 o'clock. Mr. J. T. Horner, Secretary to the Farmers' and Cleveland Dairies Company, Ltd., then read a very interesting paper on

THE MILK SUPPLY: FROM THE DISTRIBUTORS POINT OF VIEW.

By J. T. HORNER, London.

One of the principal aims of the distributor is to supply his customers with a pure milk in good, fresh, sound, and clean condition, and, speaking generally, his efforts have in the past been far in advance of any legislation or regulations.

That he is the first to suffer from any scare, either from an outbreak of epidemic disease or extravagant press articles, cannot be doubted, and in many cases the result is to destroy in a very short time the labour of a lifetime. Cases have occurred within my own knowledge where good sound businesses have thus been ruined and the proprietor reduced to extreme poverty through scares which, in the light of more recent knowledge, had probably no causative connection with the milk supply.

The distributor has thus been somewhat painfully educated up to the necessity of adopting all the practical safeguards which are within his power and control, and he naturally is desirous that the education of those concerned in the production, distribution, and consumption of milk from the time of its secretion to its ingestion by the consumer should be brought up to date.

This being broadly the position of the distributor, I propose to take my subject step by step, in the hope that its consideration will be approached, to use the words of the Right Hon. John Burns, with "common sense for our guide, the public health our aim, and equity our means."

I do not propose to touch upon the question of "air space in cowsheds," as this will, I am sure, be ably dealt with in the paper which is to be read to you by Alderman Waite to-morrow, except to

say that the distributor has a very direct personal interest in the proper and cleanly housing, feeding, and management of dairy cows, and that in obtaining his supplies he endeavours to the best of his ability and judgment to select dairies from farms where these conditions, plus those of cleanly habits and careful attention to details in the management of the milk, prevail.

The next desideratum is healthy cows for healthy milk, and while I do not advocate the retention of cows which may be affected with tuberculosis, I am of opinion that the danger of consumption being conveyed by milk from the bovine to the human being has been greatly exaggerated. It is, I think, common ground that this is only likely to happen if the udder of the cow is affected, and, without going into details, I venture to submit, in passing, that statistics, so far as they are available, cast considerable doubt upon the possibility. We have it on the authority of the Local Government Board, in a recent report by Dr. Bulstrode, "that in the year 1838 the deaths from consumption at all ages were 59,025, or 39.9 per 10,000 living; in 1855 they were 52,290, or 27.7 per 10,000 living; and in 1906 they were 39,746, or 11.5 per 10,000 living." It will thus be seen that, notwithstanding the enormous increase in the population, the mortality from this cause has fallen by approximately *twenty thousand*.

Several writers have put the number of cows in the kingdom affected with tuberculosis of the udder at 80,000, a figure which cannot be too often or too emphatically disputed, because it has so very frequently been seriously adopted in discussion on the subject in the medical world and elsewhere. That that number of cows may be more or less affected with tuberculosis in some form is within the region of probability, and that those affected with tubercle of the udder may number about 16,000 is also possible, but, if investigations are worth anything at all, very doubtful.

The milking of the cows should be done in the most cleanly manner practicable; those engaged in the milking operations should be personally clean, particularly should this be the case with the hands, and every possible precaution should be adopted to prevent any hair, scurf, excreta, or dust particles getting into the pail with the milk; but as, with the greatest possible care, it may not be possible to entirely secure this, the next best thing is to provide for its early removal by means of an effective scyle or strainer. The ordinary wire gauze strainer is not satisfactory, but if to it is attached a piece of ordinary flannelette, and the milk allowed to flow from the refrigerator through it into the churn, which it does slowly, it will be cleansed before the deleterious matter has had time to do mischief. The milking should be thorough and complete, and there must be no keeping back of the strippings. As the milk is taken from the cow—if it is to be dispatched by rail—it should be conveyed to the cooling-house, and not allowed to stand in the byre or shed, for two reasons: First, that it is more liable to contamination while in its natural warm state, and,

secondly, that the keeping qualities of the milk are increased by the promptness of the refrigeration. If, on the contrary, the farm is supplying a local district with "warm" milk, it is equally necessary that the milk should be removed from the byre or milking-shed into cool and airy surroundings pending dispatch.

It has been asserted that there need be no difficulty in reducing the temperature of the milk by refrigeration to 40 degrees Fahr., and that it ought to be so reduced, but we have not been told how this feat is to be accomplished at any country farmhouse in England. It could, of course, be done with expensive cooling plant, or with ice if it were obtainable; but for practical purposes, if there is a good water supply, obtained from a deep well or spring, there need be no trouble or difficulty, with a good pattern refrigerator, in cooling the milk down to within two or three degrees of the temperature of the water, or, say, 54 to 56 degrees Fahr. If such a water supply does not exist, and good water is equally essential for drinking by the cows, as well as for the washing of utensils, then the successful supply of milk to any place at a distance becomes much more difficult, if not almost impossible.

Given the best of refrigerators and the finest water, unless they are used with carefulness and attention to details, an otherwise excellent dairy of milk may be considerably marred, and I strongly advise that before the cooling of the milk is commenced the temperature of the water passing through the machine should be taken with a reliable thermometer, especially in the summer time, when it often happens that the water storage tank has a little left in from the previous milking-time, which has become warm and worse than useless if used for the purposes of milk-cooling. The temperature of the water being found correct, the thermometer should be placed in the bottom trough of the refrigerator, so that the actual cooled temperature of the milk may be noted.

All the cans or milking pails, refrigerator and pan, churns, and utensils should be thoroughly cleansed and scalded; special attention should in this respect be paid to the travelling churns, even though they may have been properly cleansed by the distributor before being returned. The churns at present in use are of a convenient pattern, although from a hygienic point of view perhaps not quite satisfactory; but to adopt a churn without ventilation, as has been suggested, would be to court difficulty, loss of good milk, and endless trouble. The question of sealing or locking churns for transit by rail is a debatable subject, and if the principal reason for the adoption of it be the prevention of tampering with the milk during transit, then, except that it would make it impossible to dip into the milk a dirty or insanitary vessel, it is, in my opinion, useless. While cases of tampering with milk in transit have been known, it is fair to say that such cases are rare, and, compared with the huge volume of traffic, almost infinitesimal. The railway servants as a body must not be condemned for the speculations of the few.

Before proceeding to the transit of the milk by rail, let me say that frequently a consignment of five or six churns of milk will show a deficiency in fatty constituents in one or more of the number, due to various causes, but often to want of thought. The milk is run over the refrigerator, and as the churns are filled they are removed and placed aside while the others are being filled, and when the whole operation is completed, the contents of the churns are made up or reduced to the gauge marks by transferring a portion of one to another, and so on, with the result indicated. If it should happen that the inspector obtains from the distributor a portion of that particular churn, a summons follows, and suspicion of the *bona fides* of both producer and distributor is engendered in the minds of each.

“Evil is wrought by want of thought, as well as want of heart.”

Having got our milk ready for despatch, it passes from the hands of the producer to that of his agents, the railway company, one of whose conditions of contract is that the consignor shall either by himself or his servant assist in loading the milk into the train, and possibly on branch lines this regulation is adhered to, but that it is not universal is, if our friend Mr. Middleton is right in his paper read at the Farmers' Club recently, quite certain.

Milk should be despatched twice a day as soon as possible after milking, and there should be no opportunity for it to stand at a wayside or any other station in the sun or exposed to contaminating influences.

It should be conveyed in trucks or vans built and kept specially for the purpose, and not in the ordinary guard's van, along with live calves, dogs, or other animals, and ordinary merchandise. I have no doubt that if concerted action were taken, and influential representations made to the Railway Board, such vans would be provided for the local traffic, the same as is done by some of the railway companies for the main line through milk trains. There should be no despatching of the milk once a day, especially in the summer-time, and of that still greater evil, the night's meal of one day with the morning's milk of the next day, sent to the station in the middle of that day to be despatched by the night's train, the one meal being 24 hours and the other 12 hours old before it leaves the departure station. I do not allege that such cases are numerous, but they have come within my own personal knowledge occasionally.

In addition to suitable vans for the transit, it is very desirable that the train service should be better adapted to the needs of the traffic, which is constant, and not subject to the fluctuations of ordinary passenger and commercial traffic. There are plenty of places with no Sunday train service, and where the week-day service does not fit in with the main lines service as it might do.

We have heard a good deal from the medical officers, and also from the farmers, recently on the question of warranties, a subject which is in itself sufficient for an afternoon's discussion. On the

one hand it is contended that the warranty should be abolished because it is practically impossible to obtain convictions, and, on the other, that the farmer should not be held liable for something which has passed out of his possession. That a good deal may be said on the latter there is no doubt, but what about the distributor's position? Take the case to which I referred earlier, and which is by no means a rare one. The consignment is received in good faith as being in accordance with the contract, the deficient churn is despatched to a particular dairy or round for retail, and is *bona fide* sold in the same state as it was received. Again, that other "grievance from which the producer undoubtedly suffers, viz., his liability to prosecution and conviction for milk which, though perfectly genuine, fails from some natural cause to satisfy the limit laid down in the Sale of Milk Regulations." Experience strengthens rather than weakens the contention placed before the Departmental Committee, and so ably emphasised in the Minority Report, that at certain seasons of the year, and from causes beyond the control of the producer, well-fed, healthy, and carefully-managed herds of cows do yield milk containing less than 3 per cent. of fat. In both these cases the distributor's is the greater risk, because from him, and not from the producer, the samples are as a rule taken, and his *bona fides* called in question. The distributor cannot ascertain before the sale to the public or inspector what the quality of the milk in every churn is. The *seller* is liable to a penalty of £20 for the first offence, £50 for the second, and £100—or three months' imprisonment with or without hard labour, at the option of the Magistrate—for the third or subsequent offence. It is not necessary on the part of the prosecution to prove knowledge, nor is want of knowledge any defence. Is it reasonable to take away from the honest trader the protection the warranty affords, and leave him liable to be branded as a criminal (for it must be borne in mind that it is a criminal proceeding) for something over which he had no control?

The number of such defences which have reverted back to the farmer in the past have not been numerous, and it seems to me that the weight of evidence is in favour of the retention of the warranty. The Act of 1899 places the giver of a warranty in a very much better position than he previously occupied, and gives him the right to be present at and take part in the proceedings of first instance; besides which, the Act applies to all articles of food, and unless the proposed new legislation repeals all other Acts of Parliament in so far as they affect milk, the probability of an exception being made in favour of that article only is, to say the least, doubtful. Personally, I shall oppose any repeal of the warranty clause, unless such repeal be accompanied by some safeguarding of the position of the man who carries on his business straightforwardly. The fraudulent use of a warranty carries with it its own heavy penalty, and is to that extent a protection to the giver of the warranty.

The person who wilfully adulterates or improverishes so valuable an article of food as milk, either by the addition of water, or separated milk, or the abstraction of cream, by whatever process such is accomplished, be he producer, distributor, carrier, or servant of either, and by whose dastardly act the good names of all concerned are imperilled, deserves no sympathy, and where the facts are clearly established, no penalty imposed by Act of Parliament can be too severe. Separated milk as such is a valuable article of diet in combination with other foods, which is not sufficiently appreciated, but it must be sold as and for what it is; and vessels containing it, whether in transit or in the selling of it, should be distinctly marked or labelled.

Turning now to the distribution, the milk is received, in the majority of instances, by the wholesale dealer, who distributes it to the retailers, while in an increasing number of instances the retailer obtains his supply direct from the farmer in the country. The train service renders it impossible that the company's condition "that the consignee or his agent shall be present on the arrival of the trains and assist in the unloading" can be carried out, besides which, in the case of some of the northern lines, trains which may arrive at or near the scheduled time are delayed in transfer to the milk platforms; consequently, the condition is more honoured in the breach than the observance.

Usually the milk is conveyed direct from the railway platform to the retailer, but in some instances, in the case of large retail companies, it may be conveyed to the chief depot, and thence despatched to their respective branches, but as this process involves delay, it is not universally followed. Time is the very essence of the milk business, and as the morning deliveries to customers commence at 5 o'clock, or very soon after, there is not a moment to be wasted, and the same remarks apply to the later deliveries. The retail distributor realises that if he is to hold his own in these days of keen competition he must see to it that his rounds are served with almost clockwork regularity, that the milk is clean, fresh, and without taint. He is bound to accept the quality in good faith, as it is not in his power to ascertain whether the proper constituents are present before the milk is sent out for sale. This can only be done at a later stage, and although he may not have examinations made daily, he is becoming educated up to the necessity of having frequent analyses of his supplies made. It must be borne in mind that he is the butt of all officialdom, both as regards sampling and inspection under the Dairies, Cowsheds, and Milkshops Order, which are generally pretty well enforced against "dairymen" throughout the Metropolis. Having, so far as in him lies, tried to supply his customers with a pure, sound article in good condition, he still has to put up with a good deal of annoyance because "the milk wouldn't keep," very often in consequence of the method of dealing with it after it entered the house of the consumer, but sometimes from preventable causes at the farm.

That other methods of distribution exist where the conditions are not so satisfactory from a hygienic point of view, and where the registration is simply as "Purveyors of Milk," goes without saying; but it must be remembered that until the inhabitants of the poorer, aye, and in some of the better class districts also, are educated up to the fact that a pint of milk is much more satisfactory and valuable as a food or beverage than a similar quantity of beer, the small purchaser of a "farthingsworth" must be provided for, and encouraged to better things, and this will not be effected by the removal of the medium of supply to a more or less considerable distance.

In addition to having frequent samples taken under The Sale of Food and Drugs Acts, the distributor now has samples taken from him from time to time without being supplied with a duplicate or being informed of the particular purpose for which the sample is taken. All he is told is that it is taken for bacteriological examination, a phase of the question which has arisen out of the Private Bill legislation of recent years.

The bald statement of "bacteriological examination" may mean an examination for one of as many as a dozen different organisms, each of which may require different methods. Say the distributor takes a sample from the same supply for his own satisfaction and sends it to a bacteriologist, he cannot instruct him what to look for, not knowing whether the official examination is for typhoid, diphtheria, tuberculosis, or simply for "dirt," whatever that term may mean in the official dictionary.

It is therefore imperatively necessary that in any general legislative measure concerted action be taken to obtain the protection which would be afforded by a declaration of the specific organism sought, or the nature of the examination to be made, and providing for the division of the sample taken into at least two parts, one to be left with the vendor.

There is no doubt that this energy on the part of the local authorities has been induced by the reports of committees, the discussions in medical societies, and the agitation in the public press, and it is a subject which it behoves both the producer and distributor to give immediate and constant attention to.

With a milk produced, carried, and distributed under the conditions I have endeavoured to indicate, the possibility of contamination would be reduced to a very considerable extent, even if it was not wholly prevented, and I think I have not advocated anything but what with ordinary care and "common sense" the practical man can easily accomplish.

If the Dairies, Cowsheds, and Milkshops Orders had been compulsorily applicable to the whole of the kingdom, I doubt if

there would have been need to introduce a new Bill; but as we are to have a new Act, let us endeavour to get one of a comprehensive and consolidating character, so that we may have only one Act to trouble with, and not, as now, numerous Acts, some of which only incidentally touch the milk business, but are nevertheless to be taken into account.

It may be news to you that recently Section 47 of the Public Health (London) Act has been put in operation in respect to milk by the City Authorities, which is quite a new departure.

The agitation for legislation dates back to about 1898, especially with regard to tuberculosis. It will be remembered that on the 20th December of that year a memorable meeting was held at Marlborough House, arising out of which it was stated that "tabes mesenterica in children is traceable to tubercle in milk," and that cause has been stated "to be largely responsible for the high rate of mortality in infants under one year." I have not been able to obtain statistics on this point for the whole of the kingdom, but for the administrative county of London I find in "London Statistics," Vol. 17, the latest publication of the London County Council, issued in September, 1907, the following :—

Births in 1905	Deaths under 1 Year	No. thereof from "Tabes Mesenterica"
126,620, or 28·4 per 1000 living	16,629, or 129 per 1000 births	97, or 0·77 per 1000 births or 6 per 1000 deaths

So that out of every 1000 children born during that year less than one died from this cause, while of the deaths under one year, out of every 1000 six were attributed to it, and these figures show an appreciable diminution when compared with those for 1904.

The average infant mortality from all causes—

For the ten years 1886–1895 was for every 1000 births ..	151
" " " 1896–1905 " " " ..	154
" four " 1901–1904 " " " ..	140
" year 1905 " " " ..	129

The published charts show that the death-rate is largely influenced by weather conditions, attaining the highest point in the months of July or August, depending upon which of those two months are hottest, and falling to the lowest point in May and June, when usually mild and genial temperatures prevail.

How far the consumption of milk or food generally may have any influence on infant mortality may be inferred from the following infantile death-roll :—

	1904	1905
Tabes Mesenterica	142	97
Tubercular Meningitis	270	278
Tubercular Peritonitis	160	145
Tubercular Phthisis	71	55
Phthisis	15	8
Other Tubercular diseases	225	174
Epidemic Diarrhoea	2,347	1,729
Diarrhoea Dysentery	1,374	903
Enteritis (not epidemic)	362	369
Gastro-Enteritis	344	358
Other digestive diseases	355	312
	<hr/> 4,782	<hr/> 3,671
Measles	553	392
Bronchitis	1,277	1,206
Whooping-cough	637	631
Pneumonia	1,719	1,675
Convulsions	1,120	899
Other Respiratory diseases	121	95
Premature Birth	2,639	2,506
Suffocated in bed	533	442
Other accidental causes	141	145
Other diseases	3,422	3,220
Venereal diseases.. .. .	279	290
	<hr/> 12,441	<hr/> 11,501
Thirty-five other causes	797	700
Giving the totals of	<hr/> 18,903	<hr/> 16,629

Assuming that food is the causative agent in the first two groups, is there any sound evidence that milk as at present distributed is to any extent responsible ? Adverting in this connection for a moment to the Local Government Report previously referred to, that consumption has decreased so largely in the last 50 years, not only in adults, but in children and in all districts, one is led to consider the historical aspect of the London milk trade, and in conjunction therewith the general death-rate.

It is well known that prior to the disastrous cattle plague years (1865-7) London was dependent upon the cows kept in the Metropolitan area, or within a radius of a very few miles thereof ; that in consequence of the slaughter of so many of the animals it became necessary to seek "fresh fields and pastures

new," and that with the application of the refrigerator an impetus was given to what was practically a new industry.

In adapting means to circumstances, I think I may fairly claim that, in this instance, the distributor, as represented by your Chairman of to-day, was an easy first, and it cannot be disputed that since that time the consumption of milk has been at least quadrupled. That being so, if milk is and has been the great cause of mortality, as alleged, one would expect that the death-rate would have moved upwards in sympathy. What are the facts? The mean death-rate in London from 1840 to 1905 was 21.6 per 1000 living. In 1841 it was 12 per cent. above the mean, and, with the exception of 1850 and 1872, it was above the mean down to 1879. Since that year it has shown a downward tendency, fluctuating from time to time, till in 1905 it was the lowest on record, viz., 15.9 per 1000, or 28 per cent. below the mean.

This would tend to show that as the consumption of milk increases so the public health benefits and the rate of mortality decreases. If, by means of education, literature, lectures, demonstrations, or other agencies, the true value of this article of food can be brought home to the population, and they be induced to use it instead of "more potent liquids," the strong probability is that the pace at which we have been moving in recent years in the eradication of disease would be materially accelerated, to the good of the community, the benefit of agriculture, and incidentally of the distributor.

Colonel Arthur Barham (London), in opening the discussion, remarked that railway servants seemed to have an attraction to put fish and milk together in a vehicle, and if milk cans were ventilated then odours and bacteria from obnoxious substances could enter the milk. Foreign countries did not use ventilated cans, and it was a question whether the practice here was anything more than an old-fashioned prejudice. His Company had been for some time making experiments with cans without ventilation, and the results were most satisfactory. As to increasing the price of milk, it was a question how far they could go before bringing in foreign competitors. With regard to the question of warranty, it would be used as a cloak for systematic adulteration, and therefore the warranty ought to go. If they were abolished, criminal proceedings should disappear, and the offence should not be for selling adulterated milk, but for selling milk below the standard. He referred to statements which had appeared in the Press exaggerating the danger of disease arising or said to arise from milk, and was inclined to think that now such statements would have the effect on the public like the cry of "Wolf," for when so many people were found to be still living it would lead them to believe there was not much to fear after all. Many of the large distributors of milk were in advance of legislation, so that if fresh

legislation were reasonable it would be welcomed by them. He thought the Association should appoint a committee whose business should be to watch the reports which appeared in the Press, especially to ensure the dairy trade point of view being correctly represented. He moved a hearty vote of thanks to Mr. Horner for such an interesting paper.

Mr. A. Hailwood (Broughton) seconded the vote. He said it was possible producers might secure more for their milk, but did not think distributors would get increased prices. He thought too much labour was wasted in distribution, but combination would cheapen the expense of distribution. He fully believed a larger consumption of milk would be accompanied by a lower death-rate. He had obtained statistics in respect of Manchester for 1890, which showed that the consumption of milk per day was 18,000 gallons. In 11 years it increased to 30,000 gallons, and the death-rate in that city during the same period had declined.

In supporting the vote of thanks, Mr. C. F. Thwaite, of London, referred to a point in the paper, viz., refrigeration, and thought this should be done after the milk had been strained—at the highest temperature possible—immediately after leaving the cow. No trade suffered so much as theirs in connection with the law of supply and demand, the cause responsible for an increased demand was often attributable to a reduced supply. Distributors also had to encounter many difficulties in the underselling by competitors at unremunerative prices. A company in North London had recently been supplying milk at 2d. per quart. If the effect of new legislation was to drive the small men out of the trade, would the Government plant down inspectors in every large establishment to see that all was straight, and adopt a plan which operates in the case of brewers?

On behalf of the Derbyshire Dairy Farmers' Association, Mr. Robert Finney (Hemington) apologised for the inability of that Society to assist the Mayor and representatives of the Derbyshire Agricultural Society in welcoming those present to Derby. He was unable to reach the Guildhall in time, but he could assure them that dairy farmers of the county were extremely pleased to have them in their midst. He took the opportunity of thanking the President on behalf of the farmers of the country for the assistance he had rendered to them in connection with the milk standard. He remembered Sir George was a member of the Departmental Committee appointed to hear evidence. He had asked the Committee that if they did fix a standard, to make it so that farmers would not be called upon to pay penalties for a matter over which they had no control. As to the warranty question, he did not know that they as farmers desired it to be done away with absolutely, but they wished to be relieved of the responsibility of a warranty after the milk was out of their control. (Hear, hear.) Milk was put into the railway companies care, who carried it to the large towns. Unfortunately for him, his grievance was that it did

not reach its proper destination, as he had had postcards intimating that another churn was lost, and therefore farmers ought not to be held responsible for the state of the milk when it did arrive at its destination. Mr. Horner seemed to indicate that he did not wish the warranty to be done away with.

Mr. Thomas Nuttall (Utttoxeter) said he did not object to women claiming what they contended were their rights, and he considered that if mothers would be more natural, and take more notice of the sour glass bottles in which they mixed condensed milk, they would be doing more good to humanity than in trying to obtain a vote. He warmly advocated a better system of feeding children than by using condensed milk, which he considered was one of the greatest causes of mortality, and he would prevent it by Act of Parliament if he could. He considered railway companies should be compelled to clean out vans before putting milk into them. On opening the door of a returned van, either with empty churns or with none at all, the stench was nearly sufficient to knock one down. This could be obviated to a certain extent by the middlemen thoroughly washing and steeping the churns in cold water before they were sent back.

Mr. George Cooke (Chester) said that he was sure that the Federation of Dairymen's and Cowkeepers' Association of the United Kingdom, which he represented, would assist the British Dairy Farmers' Association in dealing with coming legislation, and complained of the unsatisfactory state of affairs associated with the "owner's risk" clause in the matter of railway carriage.

Miss Martha Brown (Lancashire) said: Seeing that woman had nothing to do with legislation at the present they might wonder why she spoke, and thought that from the point of view of one who tried to discover what it was necessary to train students for, the paper and discussion showed that one point on which it seemed very essential on which they should possess knowledge was the quick manipulation of milk suddenly thrown on their hands to be able to dispose of it to commercial advantage.

Mr. Milner (Bradford) spoke of the advantage which would accrue to farmers and middlemen by working together. He said he represented the Bradford Farmers' Association, who were fighting the milk dealers, and that the farmers in his neighbourhood tried to raise the price of milk from 3d. to 3½d. per quart; but the middlemen opposed that, and endeavoured to create public sentiment against them, so they had started a depot of their own with the object of bringing pressure to bear upon the dealers, and it remained to be seen what the result would be.

Mr. J. Gough (Bucks) was of the opinion that a warranty for milk should cease at the sending station. Railway companies charged less when the milk was carried at owner's risk, but any difficulty with regard to its loss might be overcome by farmers having an insurance of their own.

Mr. J. F. Harrison, of the same district, supported the previous speaker, and added that he was thoroughly convinced that milk which he had sent to London had been tampered with at the terminus, and that railway companies should be made responsible for milk while under their control.

Mr. J. Longbottom (Halifax) stated in that town they were fortunate enough to have a medical officer who had some experience of agriculture. Whenever a sample of milk was taken from a retailer and found to be below the standard, no proceedings were instituted without some effort being made to trace the source from whence the milk came, and to ascertain the quality before it reached the retailer. He agreed with previous speakers that a higher price should be paid for milk.

Mr. C. Burnett (Burton-on-Trent) thought that pressure should be brought to bear upon railway companies to safeguard the goods of the dairy farmer, and that it was a gross injustice that farmers should have their milk lost without being able to secure compensation, and in addition to have to pay carriage. Farmers should not be responsible for milk after it left their hands. He appealed to the Association to assist them by endeavouring to remedy that state of affairs. In three months four of his churns of milk had been stolen from the platform at the railway terminus under the very noses of the company's officials. As to a warranty, if samples were taken before milk left their home station they were willing to be responsible.

Dr. Thomas Milburn (Kingston) said it was the duty of public institutions to accept the lowest tenders for supply of milk subject to compliance with conditions. No one could expect to get any more than 4d. per quart from the poor—they could not afford more.

Mr. Heald (Derby) wondered that infantile mortality was not greater considering the infinitesimal quantity of milk consumed by some families. He thought the matter of warranty was a very important one to dairymen, and not to be treated lightly, as the milk was liable to be tampered with before reaching the retailer.

Mr. Thomas Nuttall said the gist of the whole day's Conference was the question of infantile mortality, and his opinion was that this largely resolved itself into a question of natural against artificial feeding, and moved that those present pass the following resolution, viz. :—

“That as it is shown that a large percentage of infantile mortality is due to insufficient nourishment arising from the use of condensed skimmed milk, it is desirable that a standard should be fixed by the Board of Agriculture for condensed milk.”

This was seconded by Mr. W. Elliott (Middlesex), and carried unanimously.

The vote of thanks to Mr. Horner was cordially endorsed, and the business proceedings for the first day came to a close.

At seven o'clock the members of the Conference dined at the St. James's Hotel, Derby, when a number of guests were invited. The chair was taken by the President (Sir George Barham, J.P.), who was supported by the Rt. Hon. Jesse Collings, M.P. (Vice-President), the Chairman (Mr. W. C. Brown), and the members of the Conference Committee. Among the guests were the Mayor of Derby (Alderman Arthur Simpson).

SECOND DAY'S PROCEEDINGS.

A very wet morning greeted those who assembled at Derby Station on Wednesday, from whence they were conveyed by special train to Bakewell to resume the Conference in the Town Hall. The chair was to have been occupied by His Grace The Duke of Devonshire, but he sent a telegram expressing his regret at being unavoidably detained in London, and wishing the Conference every success. In his absence, Colonel H. Brooke Taylor, Vice-President of the Bakewell Farmers' Club, occupied the chair, and extended a cordial welcome to the visitors on behalf of that Club and the district generally. The Society was one in which His Grace took a great interest, and he was sure it must have been very important business indeed which had kept him away. He remarked that theirs was a great milk-producing district, and expressed the hope that the British Dairy Farmers' Association would succeed, and render the great service to the country which he knew was their object, and which he felt sure would be attained.

Sir George Barham, in expressing the thanks of the Association to Colonel Brooke Taylor for the welcome he had extended them, said he was sure they all deeply regretted the absence of the Duke of Devonshire, though they knew that at this time he must be fully engaged. They knew he was President of the Royal Agricultural Society of England, and were all aware of the great interest he took in dairying. He believed he was right in saying that His Grace was President of the Derbyshire Dairy Farmers' Association. He believed that some of the large towns had tapped the Derwent Valley for a water supply, and he knew London and Manchester had tapped the district for many years for a supply of pure milk. That which came from the district was considered to be of the best. (Cheers.) He thanked Colonel Brooke Taylor for kindly consenting to take the Duke's place and preside over their proceedings.

The Chairman then called upon Mr. Christopher Middleton to read his paper, entitled

SUGGESTED AMENDMENTS OF THE DAIRIES, COW-SHEDS, AND MILKSHOPS ORDERS IN RELATION TO BUILDINGS AND INSPECTION.

By CHRISTOPHER MIDDLETON, Vane Terrace, Darlington.

In view of the very great attention which has recently been directed to the question of the "Milk Supply," not only in the press, both agricultural and daily, but also by all representative agricultural associations in any way connected with the dairy industry, and the great interest aroused thereby throughout the whole country, and also in view of the fact that the Government have promised during this session to introduce general legislation dealing with the whole question of the production and distribution of milk, it is but natural that this present Conference, held under the auspices of the British Dairy Farmers' Association, should be largely devoted to the consideration of those questions which are likely to be the subject of the forthcoming legislation, more especially as the Conference is being held in a county which contributes so largely to the milk supply of London and other large towns, and so many of whose farmers are likely to be affected by such legislation, which if by any mischance should prove to be of an ill-considered character could not fail but have far-reaching consequences, not only to all concerned both in the ownership and occupation of land within its borders, but also indirectly to the consumers generally throughout the country.

It may, I venture to think, be taken for granted that every member of this Conference, and everyone taking any part in it, as well as the majority of farmers and cowkeepers, are fully alive to the great importance and the absolute necessity from the standpoint of public health that the milk supply of the country should be above suspicion; and whether it is intended for consumption as milk, or is to be manufactured into butter or cheese, it is equally essential that it should be the product of perfectly healthy cows, kept under strictly sanitary conditions and surroundings, and dealt with in a cleanly manner from the time it is drawn from the cow till it comes into the keeping of the consumer. Nor does the need for strict cleanliness end even then, for it is by no means certain that more mischief is not caused by the lack of this and of ordinary care, after the milk is delivered, than before it left the hands of the producer or distributor.

Although, happily, a very large proportion of the milk supply of the country is produced under perfectly satisfactory conditions, nevertheless it cannot be denied that a not inconsiderable quantity is still produced and dealt with under conditions which leave much to be desired, in some instances merely resulting in the milk being impure so far as a want of cleanliness is concerned; in others,

fortunately not so numerous, the result being that it may be actually dangerous to human health, either as containing the bacilli of tuberculosis as drawn from the cow, or as becoming afterwards so infected.

As to what proportion of the samples of milk which on examination are found to contain this bacillus have become infected before or after milking it is difficult to speak with any certainty, but, so far as figures are available, there is reason to believe that considerably under one per cent. of the cows in the country suffer from tuberculosis of the udder, and that, unless the udder is affected, the milk even from an otherwise tuberculous cow does not, when drawn from the cow, contain these bacilli. If this is so, there should be little difficulty under a proper and thorough system of inspection, combined with slaughter and reasonable compensation, of eliminating these admittedly dangerous cows from the dairy herds of the country. What is probably a much more frequent source of infection of milk is the presence in cowsheds, where the milk often remains longer than it should do after being milked, of cows in an advanced stage of generalised tuberculosis. Not only for this reason, but also on account of the very serious menace which they become to the health of all other cows in the same shed, such cows should be promptly slaughtered. This, however, is a question which I understand is to be specially dealt with in other papers read at this Conference.

Nor must the risk of infection of milk in the course of transit, nor the risk of infection from human sources, be lost sight of.

As regards the less dangerous, but none the less unsatisfactory, state of affairs, where dirt rather than disease forms the chief indictment against the milk supply, whilst the responsibility for this state of affairs mainly rests upon the individual farmer or cowkeeper, there are a certain number of cases in which he is not solely and entirely at fault. There exist throughout the country buildings occupied as cowsheds which, from their construction, their inadequate lighting and ventilation, their insufficient floor and air space, the unsuitableness of the material of which the floor is composed, the entire absence of any channel or drainage, etc., are totally unsuitable for the purpose, and which no amount of care and cleanliness could render suitable. Where this state of things exists, the occupier can scarcely be expected to provide a remedy. But, as is frequently the case, buildings which from their structural defects need the most care and attention to render them at all passable as cowsheds, are also the most neglected in this respect, and the combined failure to meet the necessary requirements may well prevent them being longer allowed to be used for this purpose. It is worthy of consideration whether, under future regulations, any notice of necessary alterations should not be served upon the owner as well as the occupier of such premises. As neglect or refusal on the part of an owner to comply with such notice, which resulted in the refusal on the part of the authority to register the

premises for the purpose of milk selling, would inevitably depreciate their letting value, such non-compliance would not probably often occur. Also Section 6 of the last Agricultural Holdings Act, which relates to repairs of buildings, may also be of some assistance to the tenant in such a case.

Another matter for which the occupier can scarcely be expected to provide a remedy occasionally occurs on dairy farms, especially at certain periods of the year, and that is, the absence of a suitable water supply, not only for drinking purposes for the cows, but also for cleansing the milk vessels, etc. Any future regulations will probably deal with this question.

Granting that some proportion of the milk supply is produced under conditions which do not satisfy the reasonable requirements of public health, it follows that the regulations in force for securing this object are either insufficient for the purpose or they are not properly enforced. That the regulations in force, which are mainly those made under the Dairies, Cowsheds, and Milkshops Orders of 1885 and 1899, are not universally deemed to be sufficient may be inferred from the fact that nearly one hundred local authorities, mostly borough councils, have by private legislation obtained further powers for dealing with the milk produced or coming into their respective areas. That regulations when made are not always properly enforced will not be denied by those best acquainted with the subject, as in some districts inspection is either not carried out at all or is done in a notoriously perfunctory manner. Beyond this, up to a year ago, some 327 out of 1,794 borough or district councils had made no regulations under the Order of 1885, and consequently it may not unreasonably be assumed that practically little supervision or control is exercised over the milk supply of these districts. To remedy this state of affairs where it exists, and to put an end to the unstatesmanlike system of piecemeal legislation which has been going on every session of Parliament since 1899, for it goes without saying that if further powers are really needed to safeguard the health of those within the area of any particular local authority (and we must assume that they are necessary by Parliament every year granting these powers to those seeking them), they are equally needed in the interests of those outside these areas. In short, what appears to be necessary is to consolidate and amend the Dairies, Cowsheds, and Milkshops Orders of 1885 and 1899, and the regulations made under these Orders, in such manner as experience has shown to be necessary by an Act of Parliament which should in no respect be adoptive but compulsory, and applicable to the whole country, which should be administered by the county councils, and under which no local authority should have any power of inspection or jurisdiction outside its own area, but, if necessary, might adopt the procedure set out in Sub-section (2) of Section 60 of the Public Health (Scotland) Act, 1897; and in case of default by any county council, reserving power to the Board of

Agriculture or the Local Government Board to appoint someone to carry out the Act at the expense of the defaulting authority.

But whilst advocating such an amendment of the law and of regulations which are proved to be necessary in the interests of public health, and for ensuring a clean and healthy milk supply, on the other hand the very greatest care must be exercised not to go beyond what is actually necessary to attain this object. No needlessly restrictive regulations must be imposed, either by way of prescribing an unnecessary amount of air space, or by closing cowsheds which, though scarcely conforming to modern ideas of what such erections should be, can yet by reasonable alterations and the exercise of ordinary care and cleanliness be made and kept in a wholesome condition, and such as will maintain the health of the cows therein. Any unnecessary strictness in regard to such matters must tend to curtail the available milk supply, which, as a rule, does no more than keep pace with the increase in population, and any serious diminution in this supply, which already only works out at a very small quantity per head of the population; would probably have to be met by the use of imported fresh milk, or of imported condensed milk, some of which, for anything we know to the contrary, may be produced under conditions no better than the worst prevailing here. If that were so, the effect of putting our own house in order might still not be such as we are all desirous it should be.

The question as to what form the suggested general legislation affecting the Dairy Industry, and particularly in regard to milk production, should take has been very fully and carefully considered during the past year by agriculturists and dairymen, and especially by the Central and Associated Chambers of Agriculture, the British Dairy Farmers' Association, and the Tuberculosis (Animals) Committee, which is composed of representatives of nearly all the principal agricultural societies and breed societies in the kingdom. Very great unanimity has prevailed in these discussions, and strong representations have been made by all these bodies to the Government on the subject. The report of the Council of the British Dairy Farmers' Association of December, 1907, which states that no legislation on the subject would be satisfactory to those engaged in the dairy industry unless it provides as under, may be taken as embodying the views of most of those taking part in these discussions:—

1.—That the Dairies, Cowsheds, and Milkshops Orders of 1885 and 1899 be consolidated and amended in such manner as shall be approved by the Board of Agriculture

2.—That adequate legislative steps shall be taken to secure the proper (a) lighting, (b) ventilation, (c) cleansing, (d) drainage, (e) water supply, of such cowsheds in both Urban and Rural District areas; provision being also made for the proper cleansing of cows and premises adjoining the cowsheds.

3.—That the question of air space in existing cowsheds shall not be dealt with by hard-and-fast regulations, but that regard must be had in

all cases to the situation and surroundings, and any regulations dealing with this matter must be subject to the approval of the Board of Agriculture.

4.—That every County Council shall only register such premises as they may deem suitable, and when the premises to be occupied as a dairy or cowshed shall have been made so as to satisfy their requirements.

5.—That all premises occupied for the purpose of milk selling within the meaning of the Dairies, Cowsheds, and Milkshops Orders shall be inspected by the Inspector to the County Council not less than twice in each year.

6.—That all cattle used for the purpose of milk selling shall be examined (especially for tuberculosis of the udder) by duly qualified veterinary surgeons appointed by the County Council not less than twice in each year.

7.—That every animal which appears to show symptoms of tuberculosis of the udder shall be isolated, and the County Council informed thereof. That if considered by the Council's Veterinary Surgeon to be so suffering the cow shall be slaughtered. Previous to the slaughter the cow shall be valued as a milking cow by a public valuer appointed by the Board of Agriculture. Immediately after slaughter the cow may, at the request of the owner, be examined either by an independent veterinary surgeon or by one appointed by the Board of Agriculture. If free from tuberculosis of the udder, the full value shall be paid to the owner (plus two pounds to cover the loss sustained by dislocation of his business) out of the National Exchequer. If affected with tuberculosis of the udder, three-fourths of the value shall be paid out of the National Exchequer. The County Council to bear and pay any cost of any valuer or veterinary surgeon employed for this purpose.

8.—The Model Milk Clauses, or any similar clauses to the same effect contained in all previous private Acts, to be repealed.

9.—That the Dairies, Cowsheds, and Milkshops Orders of 1885 and 1899, as consolidated and amended, be made compulsory.

10.—That any legislation when brought into effect shall be administered by the Board of Agriculture and the County Council.

So far as these recommendations are concerned, I must, as indicated by the heading of this paper, mainly confine myself to those dealing with buildings and inspection.

It may perhaps be of interest if I refer very briefly to the new Dairies, Cowsheds, and Milkshops (Ireland) Order of 1908, made by the Local Government Board for Ireland, which revokes all existing Orders on the subject, and came into operation on the first of last month.

In that part of the Order dealing with lighting, ventilation, cleansing, etc., of cowsheds,

Article 3 provides that every cowshed shall be lighted with windows or openings, either in the sides or roof, of not less than one-fifteenth of the floor area of such cowshed.

Article 4 provides that every cowshed shall be ventilated by means of apertures to the open air, of which apertures at least one for each two cows, with an area of not less than 15 square inches for each cow, shall be provided in the sides of the cowshed, at a height not more than 6 feet above the floor level, with, in addition, one or more openings near the highest point of the cowshed of a total area of not less than 20 square inches for each cow.

Article 5 provides for a minimum air space of 500 cubic feet for each cow in a cowshed outside a county borough, and 700 feet for each cow in a cowshed within a county borough.

But Article 6 provides that the three previous articles shall not apply to any cowshed built and in use as such before the date of the commencement of this Order if the medical officer of health, or a veterinary surgeon appointed by the local authority, certifies that in his opinion the existing arrangements for the lighting and ventilation of, and for the air space of the cows kept in, such cowshed are sufficient to maintain and keep such cowshed in a wholesome condition, and to protect the health of the cows therein as effectually as the aforesaid articles.

It remains to be seen how far the regulations to be made applicable to this country will follow on the lines of the Order just referred to.

Whilst attaching due importance to the whole of the recommendations in paragraph 2 of the report above mentioned, that adequate legislative steps shall be taken to secure not only proper lighting and ventilation, but also all the other items that follow, and especially the concluding sentence in the paragraph, viz.: "provision being also made for the proper cleansing of cows and premises adjoining the cowsheds," matters which have not always in the past received sufficient attention, one cannot but recognise the justice of allowing a difference to be made between existing cowsheds and those to be erected in the future, always, of course, assuming that the lighting and ventilation are really adequate, or are made so as soon as possible. In the case of existing cowsheds, a sufficient time must be allowed to make any necessary alterations, but they must satisfy all reasonable requirements, or registration must be refused. In all such cases I think it would be preferable that the certificate should be granted by a properly qualified veterinary surgeon rather than by the medical officer of health; and it might be well that there should be a right of appeal to the county council, or even, as a last resort, to the Board of Agriculture.

Wherever regulations are in force, they provide that the ceiling or interior of the roof, as well as the walls, of every cowshed shall be properly limewashed, unless constructed of materials such as render limewashing unsuitable, *and that may be otherwise properly cleansed*. As a rule, cowsheds in the country are not ceiled, but have open roof, which, of course, cannot be limewashed. With lively recollections of such roofs festooned with cobwebs which have long been undisturbed, it would appear necessary that any future regulations should specially provide for such roof being swept at least twice in each year, preferably at the times of the biannual limewashing.

As regards the question of air space in existing cowsheds, which is practically the crux of the whole situation, I consider that paragraph 3 of the report of the Council of the British Dairy Farmers' Association admirably points out how it should be dealt with.

As another paper follows dealing exclusively with this question, I do not propose to go into it at any length, but at the same time, owing to its importance, I cannot altogether ignore it.

Although I am not prepared to say that there should not be a minimum of air space fixed in any future regulations dealing with the subject, neither am I prepared to admit that the minimum fixed by the Order for Ireland above quoted are altogether satisfactory. The Model Regulations issued by the Local Government Board in March, 1899, for the guidance of councils in making regulations under the Dairies, Cowsheds, and Milkshops Order of 1885 make a distinction (in Part I.) between cows which are habitually grazed on grass-land during the greater part of the year, and when not so grazed are habitually turned out during a portion of each day, and (Part II.) cows not so habitually grazed or turned out. In the case of cows which come under Part I. there is absolutely no restriction as to air space, but cows which come under Part II. shall have not less than 800 cubic feet of air space.

It appears necessary to call attention to the widely different principles on which the English and the Irish Local Government Boards attempt to differentiate between the different conditions prevailing. The English Local Government Board, in a circular to the councils of rural districts, say: "The Royal Commission in their recommendations drew a distinction between the rules which should be observed on this subject as regards cowsheds situate in populous and those situate in non-populous places," but no indication was given as to the means by which the distinction was to be made. It is clear that it could not be accomplished by any test of population, or by adopting the geographical limits of urban and rural districts, without creating anomalies which would be indefensible. Neither is it easy to see how the distinction can be carried out except upon the plan suggested by the Board, which seeks to give effect to the chief difference between cowsheds in towns and cowsheds in the country, or, in other words, between the case of cows which are kept entirely, or as a rule indoors, and that of cows which are usually turned out to graze.

It seems extremely doubtful if regulations can be made under either of these systems which will be free from anomalies equally indefensible. In fact, it would appear to be impossible to frame any hard and fast regulations as to air space which may not operate very harshly under some circumstances, situation and surroundings being the principal factors which should always be taken into consideration; and, provided that the lighting and ventilation are adequate, it is matter for serious consideration whether the question of air space may not safely be left to the veterinary inspector, subject to the right of appeal to the County Council or the Board of Agriculture. One can well imagine situations where, other conditions being satisfactory, the 500 feet of air space prescribed in the Irish Order for each cow (bearing in mind the fact that many of the cows in Ireland are of very small breeds) are scarcely necessary,

whilst, at the same time, the 700 feet in boroughs may under certain circumstances be none too much.

It is interesting to note that the new Order for Ireland does not exempt from registration and inspection, as do the present English Orders (Sub-section (6), Section 6), those who sell milk of their own cows in small quantities to their neighbours or workmen, and it is difficult to explain why this exemption should have been made—that is to say, if registration and inspection are deemed necessary.

But whatever regulations may be made with the object of ensuring a clean and satisfactory milk supply, it is problematical how far they can be relied upon to effect this purpose unless they are thoroughly, universally, and systematically enforced, and without a regular system of inspection there is no certainty that this is being done.

It is pretty generally admitted that all premises occupied either as dairies, cowsheds, or milkshops should be inspected by competent inspectors, preferably appointed by the county councils, not less than twice in each year, and some premises may need much more frequent inspection.

But, in addition to the systematic inspection of premises, the agricultural bodies above referred to, who have been considering the subject in all its bearings with the object of still further safeguarding the public health, have made a new departure, and unanimously recommend that all cattle used for the purpose of milk-selling shall be examined especially for tuberculosis of the udder by qualified veterinary surgeons, appointed by the county councils, not less than twice in each year, with the additional precaution—which should still further prevent any risk of infection by cows giving tuberculous milk—that the regulations should require that any cowkeeper, if he even suspects between the periods of regular inspection that any cow in his possession is suffering from tuberculosis of the udder, shall at once isolate such cow, and give notice to the local authority, and that the veterinary surgeon of the authority shall immediately inspect the cow, and if he certifies that she is so affected, she shall at once be slaughtered; but as this slaughter is in the interests of the public health, it shall be subject to reasonable compensation. But as this aspect of the subject is being dealt with in other papers at this Conference, I do not propose to deal with it further in this paper, except to insist again upon the great importance of thorough and systematic inspection by properly qualified veterinary inspectors appointed by the county councils.

It may possibly be argued by some farmers and cowkeepers that some of the suggestions made are somewhat of a too drastic nature, and go beyond what they should be required to submit to; but it cannot be too widely recognised that considerable alterations are inevitable, and that all those concerned in the production of milk would be wise not to oppose any well-considered regulations which do not go beyond what the public have a right to demand for securing a milk supply beyond suspicion, and they will then be

in a better and stronger position to resist any proposals going beyond what is necessary.

Mr. Alderman Richard Waite, J.P., next read his paper, entitled

AIR SPACE IN COWHOUSES.

By Alderman RICHARD WAITE, J.P., Duffield, Derby.

Why is it, in these times of progressive sanitary measures, that the Dairies, Cowsheds, and Milkshops Order, which was issued by the Privy Council with all the effect of an Act of Parliament, remains practically a dead letter? It has been in force for 23 years, and should be carried out by urban and rural district councils; but very few have attempted to frame rules to meet its provisions, and an Order capable of conferring immense benefits on the community has done very little good.

There can be little doubt that most sanitary authorities, whilst anxious to carry out the Order in a reasonable spirit, are perplexed what to do with this question of air space in cowhouses, and especially with the houses erected previous to 1879, which form the great bulk of those now in use; these, by Section 5 of the Order, were excluded from its provisions, and by Section 8 were included to the extent that regulations made by the authorities must be "necessary or proper."

Sanitary authorities may make such regulations as they think necessary, subject to confirmation by the Local Government Board, "for the lighting and the ventilation, including air space and the cleansing, drainage, and water supply of the same, while occupied as a dairy or cowshed." The words "including air space" seem to form the initial difficulty. It will be noticed that the Order does not define the quantity of air to be provided, but experts on sanitary matters writing from central London and other unlikely centres for obtaining practical information on such a subject quickly decided in their own minds—and taught others—that the "necessary or proper" air space for each cow was 800 cubic feet. Medical officers of health, who are not usually cowkeepers, have generally adopted these figures, until they seem to have become an article of faith. In the Borough of Derby they have gone beyond this by declaring, (in regulations made in 1899), "in calculating such air space" (800 cubic feet) "any portion thereof at a height exceeding twelve feet shall not be reckoned." This means that as cowhouses are almost invariably open from the floor to the roof covering, the upper part of cowhouses shall not be counted in the 800 feet.

I have no hesitation in saying that 800 cubic feet of space is unnecessary in any part of this country, and what is necessary in the South of England would be disastrous on the hills of North Derbyshire and the higher parts of England. There are very few

cowhouses which comply with an 800 feet regulation, and I am convinced that in framing rules under the Order it is advisable to omit any mention of a minimum air space.

It may very naturally be asked, "Who is it who makes this confident statement, and what opportunities has he had of forming a reliable opinion?" Permit me to say, as a reply to such a question, if asked, that I am not now to any extent pecuniarily interested in the question, having retired from business, and only now keeping sufficient cows for my own household. My early days were spent on a large farm. For many years I enjoyed a large practice as an architect and land agent, making the design of farm buildings a speciality, and during 20 years of my business life I combined the occupation of a tenant farmer, producing milk sent by rail to the large towns. In 1878 I was fortunate in meeting with a wealthy client who wished to build a good homestead, and who instructed me before making his plans to visit at his expense any notable homestead in the country where I thought it probable I could pick up useful ideas. I made extensive use of this privilege—perhaps I may venture to add "profitable use." In the following year, in open competition, I was awarded the silver medal of the Royal Agricultural Society of England for Plans of Farm Buildings. In 1879, 1880, and 1881, I won, also in open competition, silver medals at the Dairy Shows in London in the class for Designs for Dairy Homesteads. In 1882 the British Dairy Farmers' Association entrusted me with the office of judge of that class, and for many years I regularly attended the country conferences of the British Dairy Farmers' Association (similar to the present happy occasion), where I also gained much useful information.

For the purposes of this article, I have referred to the plans of several of the designs which I consider among my best homesteads—on pleasure farms and for public authorities. These, I hope, were designed to provide cows with all necessary area, cubic space, light, ventilation, and sanitation; possibly I might at the present day insert a few more intercepting traps in the drains. Permit me to quote a few of the principal dimensions in three or four of my designs. I mention where the buildings can be seen. I would draw attention to the fact that they do not all provide 800 feet of cubic air space, and that all would be disqualified under the existing regulations in the Borough of Derby (see Table on next page).

At Egginton the roofs (on the recommendation of the late Alderman Canning) were covered with tiles at 40° pitch, because a broken tile can be replaced by a farm labourer.

All the other roofs are covered with slates at 30° pitch. At Alderwasley the cowhouse in single row is fitted with hay-racks, necessitating 2 feet extra width of building; there is a 4-feet feeding gangway in front of cows.

At "Blackpits" Small Holding, I provided a cottage with three bedrooms, a small dairy, calf-house (12 feet by 10 feet), cow-house for four cows (14ft. by 12 feet), without a feeding gangway,

stable (16 feet by 8 feet), two pig-styes (16 feet by 7 feet and 16 feet by 6 feet), with fowl-house over, and a fothering house (16 feet by 16 feet). With the exception of about £25, spent on

	Width of a Pair of Cows	Width between Main Walls from Back to Front	Height of Main Walls to Square at Eaves	Height from Floor to Roof Covering at Ridge	Width of Centre Gangway	Cubic Air Space for Cows	Cubic Air Space, as measured under Derby Borough Regulations
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	feet	feet
EGGINGTON SEWAGE FARM For the Corporation of Burton-on-Trent—1887.	7 0	31 3	10 0	23 0	6 0	902	645
CALLINGWOOD HALL FARM For Lord Burton—1890.	7 0	32 0	9 0	18 6	6 6	770	642
ALDERWASLEY HALL FARM For the late Mr. A. F. Hurt—1896.	7 0	18 0	10 0	14 9	none	811	721
"BLACK PTNS" SMALL HOLDING, Rangenore. For Lord Burton—1890.	7 0	12 0	9 0	12 6	none	446	440

the appearance of the cottage, I was most careful to avoid unnecessary expenditure, but the cost was £700; in other words, the whole rent of the holdings at agricultural value would not pay 5 per cent. on the cost of the buildings alone! I mention these buildings to point out that the four-stall cowhouse provides only

446 feet for each cow. Fortunately for me, the powers of the Derby Corporation do not yet reach to Rangemore.

All the examples I have quoted cost far more to erect than could be afforded on an ordinary farm on an estate managed on business principles, where the landlord obtains the greater part of his income from his estate. If 800 cubic feet of air space is to be rigidly enforced, there are very few estates which would be worth accepting as a gift, if income is a consideration. There are three ways in which I could have altered my plans to comply with the 800-feet regulation: (1) by increasing the width of the gangways, (2) by building the walls higher to the square, (3) by making the standings wider than 3 feet 6 inches per cow. To all of these I have decided objections. To (1), if the feeding gangways are made wider, the cowman will most certainly keep a store of hay and other foods in front of the cows, on which they will be constantly breathing between meals, and would not relish the food—which had been so long in sight—when given to them; (2) surely no practical man will contend that my walls are not high enough on the square; (3) if the standings are made wider, there should be a stall division to every cow, as in a stable—I made mine in pairs, with a post 3 feet 6 inches high, set back 10 inches from the manger, between them, to prevent a cow turning round in its stall and possibly treading on its neighbour's paps. I believe these alterations would entail useless expense.

Apart from the expense, I have never been able to satisfy myself that a very large cubic air space is desirable; the incoming fresh air has a larger mass of more or less foul air to displace; it is more difficult to maintain the essential warmth; cows are always, even on the coldest days, let out for water; and the extra time, apart from ventilation, that a large cubic space will keep sweet, as compared with a smaller and warmer one, is infinitesimal—in fact, the same amount of fresh air must be supplied hourly whether the space be large or small.

There is no hard and fast line as to the cubic capacity of a living room for human beings, but the general rule applies that a dwelling-house must be fit for habitation, and it is left for those who administer the law, on complaint being made, to decide whether that complaint is well founded. For many years I have sat on the Bench, and been called upon to decide whether houses are fit for habitation? I have never found any trouble in deciding such matters; but where, as in the Borough of Derby, a regulation with all the force of a law has been made compelling a minimum air space in a cowhouse of 800 feet, you are met with an initial difficulty often impracticable to overcome in an existing building, and which renders it useless to consider other improvements, however much you may be convinced that they would have the desired effect of abating nuisance.

The law does not say that because a man is poor and cannot afford to live in a large house that he shall not live in a small one;

but it does say he shall not live in a house that is injurious to health, and I would apply the same law to a cowhouse.

We hear much at the present time of bringing back the people to the land. It is part of my duty, as Vice-Chairman of the Small Holdings Committee of the County Council, to enquire into all applications for such small holdings in Derbyshire. We are empowered to provide buildings for them—*on business principles*; but though I know from past experience that it is not practicable to provide them with cowhouses containing 800 cubic feet per cow, I hope the Act will be beneficially applied in Derbyshire.

I fully realise that on many farms structural improvements in cowhouses are necessary in the interests of milk consumers—such as more light, better ventilation, better floors and drainage, an ample water supply, and impervious mangers. All these things can be accomplished under the existing Dairies, Cowsheds, and Milkshops Order; it is unfortunate so little use has been made of it.

We are promised this session a new Government Bill dealing with the milk trade. The construction of cowhouses must of necessity be dealt with in this measure. It is to be hoped that all interested in such a very important matter will carefully study its provisions as soon as it is printed, and if any of them do not meet with the approval of practical men, that they will endeavour, by representations to their local members of Parliament, or by petitions to Government, to strive to make it a workable measure—to grumble, but do nothing, must surely be a very poor policy.

Mr. C. G. Argles (Amphill), representing the Land Agents' Society, in moving a vote of thanks to the readers of the two foreign papers, remarked, in connection with the regulations, it was important that regulations made for the whole of England should be carried out in a reasonable spirit, so that it might be done with as little friction as possible by the harmonious co-operation of landlord and tenant, whose interests he regarded as identical. He agreed with Alderman Waite that it was impossible to lay down a definite rule, but he thought 400 cubic feet sufficient minimum of air space in cowsheds in exposed districts. It was to be regretted that a great deal of nonsense had been talked and written by people who had no experience in dairy farming. Farmers were in agreement as to the desirability of eliminating cows suffering from tuberculosis of the udder from the herds of the country.

Mr. A. Ireland Wright (Newcastle), who seconded the vote of thanks, caused some amusement by relating how a tenant's byre had been altered to meet the requirements of authorities, but the cows distinctly objected, and defied the whole business. He pointed out that in the model regulations no definite air space was stated, and where the regulations were thought to be too restrictive an appeal was provided to the Local Government Board.

Dr. E. M. Wrench, M.V.O., J.P. (Baslow), in the course of the discussion, said the question was not so much one of air spaces as

the amount of fresh air which got in a building, and the method by which it was admitted. Animals, like human beings, objected to draughts, and the inlets for fresh air should be so constructed that the air did not hurt the animal, but circulated freely and evenly all through the building. One thing he recommended, because it would do away with draughts, was that the outside of apertures should be smaller than the inside, a device similar in design to a megaphone. (Hear, hear.) During recent years the medical profession had greatly urged the importance of living in the open air. He happened to have been a surgeon in the Crimean war. He went through the first and second bad winters—(hear, hear, and applause)—and in the first winter, when the men were practically living in the open air, the tents were very imperfect, with no lack of ventilation, but there were very few serious chest complaints amongst them. In the second winter, when the men were in huts, with a considerable amount of cubic space, most of the principal diseases the medical men had to deal with were chest complaints, and this was the case notwithstanding the men were living on the same ground, and were very much better fed than before. He did not think fresh air would do anyone any harm, but the great point was to keep out of draughts. (Applause.)

Mr. A. P. Payne-Gallwey (Agent to the Duke of Rutland, and Chairman of Bakewell Urban Council) associated himself with the welcome extended to the delegates, and expressed his general agreement with the views of the authors of the two papers. He agreed that if farmers had to slaughter animals for the good of the public, surely it was right he should be compensated for doing so. As to condition of dairies and farms generally, these were kept beautifully clean, but he regretted there were exceptions. If a cow-house was kept thoroughly clean, other things, such as want of air space, had no ill effects, and were not so much noticed by inspectors. He felt the outcry about impure milk was greatly exaggerated, and such a Conference would be of the greatest value in bringing forward practical views on the question. In the making of legislation and the work of inspection the difficulties of obtaining an abundant water supply in some districts should not be lost sight of. The speaker added a warning against unnecessarily strict requirements that would tend to limit the supply of so valuable a food commodity as milk, as that would eventually mean less pure milk for the children in the towns. He thought Alderman Waite's paper was specially interesting, as it supplied valuable figures and details, and they were all very grateful for the information supplied.

Mr. Jesse Collings, M.P., said he knew that proposed legislation was now before the Local Government Board. He was at one time at the Local Government Board as a Secretary, and knew the course of proceedings. The permanent officials were very able men, but they sometimes had not the practical knowledge possessed by those engaged in the industries affected. Therefore he would suggest,

while there was yet time, that the suggestions embodied in these valuable papers coming from practical men should be sent to the Local Government Board, or the papers might be placed before them by someone representing the Association. (Hear, hear.) When a department was committed to legislation, it was very difficult by amendment to alter it. Members of the department did not like to admit that they were wrong in any way, and they could not do wrong in their own estimation, but they might be influenced before the Bill was finally settled. He was struck by the points in the papers with reference to the 800 cubic feet of air space. He thought the arguments, both on the part of Mr. Middleton and Mr. Alderman Waite, were unanswerable. The Conference had been told that the interests of landlord and tenant were one, but he believed a conflict of interest must of necessity exist as between buyer and seller. He readily acknowledged that the differences had been overcome to a very large extent by good understanding, good relationship, and wise agents, where they existed. But no man could be eye to eye in interests with his landlord. The commercial landlord merely made the best of his property, as did any other commercial man, while the good landlord got over the difficulty inherent to his relations with his tenants.

Mr. Primrose McConnell (Eastern Counties Dairy Farmers' Co-operative Society) ridiculed the application of hard and fast rules as to air spaces irrespective of local climatic conditions. In Essex the standard was 450 feet. 800 cubic feet was originated by the old Metropolitan Board of Works, and was now never put out by any responsible authority. He thought that the best temperature for a cowshed was from 50 to 55 degrees Fahr. When over these figures the cows sweated, and when under them the cows were cold, and their food was not doing them so much good. He knew cowsheds kept at from 60 to 70 degrees Fahr. and cows kept in such sheds were disposed to tuberculosis. Cowsheds should be open right to the top, as with the new machines now on the market they could be easily whitewashed. These machines were after the style of a hand fire-hose, and were useful for clearing off cobwebs. He had given up watering the cow outside, as it obviates the shivering which follows on partaking of a heavy draught of ice-cold water. It was time they had a uniform set of laws and regulations for the whole country, but the same regulations should apply to foreign competitors as to ourselves. Much of the imported milk came from cows kept in conditions that he would not inflict upon pigs.

Mr. A. E. Crook (representing the Dairy Trade Protection Society) said it was necessary to prevent legislation which would tend to lessen the facilities for the obtaining of milk cheaply for consumption in towns. Such restriction might have the effect of preventing poor people from buying milk. He was sure there were now whole streets in London into which the milkman never entered. Nearly all the mothers in these streets worked in factories, and the

children were left to the care of others, and probably fed on separated condensed milk. There was little fear of any decrease in the demand, and absolutely no reason to fear a dearth of milk.

Mr. T. Nuttall (Uttoxeter), referring to the noble Dukes represented at the Conference that day, the Duke of Rutland and the Duke of Devonshire, said they were two of the best landlords in the world. (Applause.) He contended, in reply to the argument of the right honourable gentleman present, that the interests of the landlord and the tenant must be identical. As to improvements in the buildings, it was the duty of the landlord to see to these, and to put the floors right. In Derbyshire they were made of cobble stones, and the tenant cannot be expected to renew these. The landlord's duty began when a notice was served, and the duty of the tenant was to keep the buildings clean afterwards.

Mr. Robert Long (Sheffield) remarked that he was himself a tenant farmer, and under four landlords, and to a small extent, unfortunately, an owner. His experience of landlords was that whenever the tenant showed a desire to work the land properly, and get improvements made, the landlord was willing to meet him. That was his idea of a good landlord.

Mr. W. C. Brown (Appleby) thought there were many tenants who would be unable to get their landlords to do the necessary alterations. He had spent a deal of money in converting a corn-growing steading into a milk-producing one, and he had been in rather low key all that day because he knew his buildings were not up to mark, and he and other tenants could not expect their landlords to do much more than they had done, but he knew that his premises had been cited as a pattern to others by sanitary authorities in his district, although the standard of 800 cubic feet of air space was not complied with.

Mr. Hailwood (Broughton) thought that Alderman Waite had not travelled sufficiently, or he would have taken a broader view.

Mr. Thomas H. Pearce (Bristol) was not in favour of inspection by county councils. All this meant higher rates, and these they wanted to keep down. The authority for carrying out the regulations where they had been adopted should be the district council.

Sir George Barham said that as far back as 1879, 1880, and 1881, the British Dairy Farmers' Association recognised the importance of properly constructed farm buildings by offering prizes for designs of model cowsheds, which showed they were in advance of the times. Many people were of opinion that the district councils were the proper authority for the administration of new regulations, and he rather thought that was the opinion of the President of the Local Government Board. But the Tuberculosis Animals Committee—a strong body, composed of the breed societies and dairy societies of the kingdom—were in favour of the county councils, because the district councils had hitherto not complied with the requirements of the Cowsheds and Milkshops Order. He regarded as valuable the suggestion of Dr. Wrench, that ventilating

apertures should be smaller to the outside than to the inside. He maintained that compensation should be paid in full for animals slaughtered in the public interest.

It was unanimously voted, as per the suggestion put forward by Mr. Jesse Collings, that the papers be put before the Local Government Board for their information and guidance, and the vote of thanks to the readers of papers was carried unanimously.

Mr. Middleton, in view of the discussion, thought notices regarding cleanliness and sanitation should be served on tenants, but notices regarding structural alterations should be served on the landlords. Inspectors should be entirely above suspicion and independent. As to the effect of these amendments on the retail price of milk, he could not answer. He hoped the farmer would be recouped. He favoured the air coming in fairly low down in the byre. His own adaptation was two feet from the ground, the Irish regulations say not more than six feet from the ground, but Alderman Waite's idea was that the inlet should be as near the floor level as possible.

Mr. Jesse Collings, M.P., proposed a vote of thanks to Colonel Taylor for presiding, who, he said, he regarded as a type of those who by local activity had contributed to England's greatness not less than had the legislative efforts of those who sought greater glory at Westminster. Mr. Collings said that, speaking from the knowledge he had derived as a representative of one of the largest cities in the kingdom, he was bound to say that no rural men who lacked that experience could realise that the deficiency of milk as a food wrought terrible havoc upon the physique and health of weak people, and especially children, and strongly supported the plea for a wider appreciation of the value of milk as a food. The poorer children of the cities, he remarked, were fed on tea, salt fish, and tinned foods, and it was not likely they could rear a strong and vigorous race on such a diet. (Applause.)

Mr. W. C. Brown seconded the vote of thanks, which was heartily carried.

Colonel Brooke Taylor expressed his thanks, and said he hoped the absence of the Duke of Devonshire would not be considered as evidencing any lack of interest on His Grace's part in agricultural affairs. As they knew, His Grace had only just recently come into possession of the estate. He could say, from his own knowledge, that no man ever entered upon his estates and the responsibilities attached to them with a greater determination to do his duty as a landlord properly than the young Duke of Devonshire.

After luncheon had been taken, the party mounted brakes to be driven to Chatsworth House. The conditions under which that drive was taken were anything the reverse of comfortable, and the passengers had a moist time. But, in spite of the elements, that did not damp the ardour of the dairy farmers, and a very enjoyable hour was spent at the first place of interest at which a stop was made, namely, Haddon Hall, one of the finest

examples of the Baronial Halls of England. Here the historic halls, with their romantic associations, were traversed under the able guidance of Colonel Brooke Taylor, Dr. Wrench, and Mr. A. P. Payne Gallwey. Again mounting the brakes, the journey was continued through country which, under more pleasant conditions, would no doubt have been termed beautiful, but the views *en route* were marred by the heavy white mist which shrouded the hills and filled the valleys. Arriving at Chatsworth House (the seat of the Duke of Devonshire), the visitors were conducted in small groups, each under a guide, through the sumptuously furnished apartments, which contrasted very considerably with the bareness of the place which had just been visited. A hurried inspection was also made of the well-kept grounds and hot-houses adjacent to the house. Cheers having been raised as an appreciation to their guides for the assistance they had rendered during the proceedings of the day, the party were driven back to Rowsley Station, where the 6-16 p.m. train was boarded for the return journey to Derby. Dinner was served to the party at the respective hotels.

THIRD DAY'S PROCEEDINGS.

Weather conditions were more promising for the third day, when members and friends gathered at Derby Station to catch the special train which steamed away for Uttoxeter shortly before 9-0 a.m. A break was made at Sudbury to enable a visit to be made to Mr. Chas. Mynors' fine herd of Shorthorn dairy cattle, which had been collected in close proximity to the railway for inspection. Mr. Chas. Mynors and his able assistants were waiting to welcome the party. The herd numbered about 100 non-pedigree animals, many sired by a magnificent roan pedigree bull (obtained from Captain W. H. O. Duncumbe), which was also brought out for inspection. In addition to the cattle seen, it was understood that Mr. Mynors also grazes between three and four hundred cattle every year on his 1,000 acres of land, only 30 of which is arable. It was understood from Mr. Mynors that the milk from his herd went partly to London and partly to Nestlé's. As Mr. J. B. Ellis stated, when thanking Mr. Mynors for his kindness during the brief visit, the herd was one of the finest lots of non-pedigree Shorthorns that the members had ever seen. In fact, one member of the party was so pleased with the condition and healthy appearance that he arranged to take all calves dropped during the year. Although the programme did not include a visit to the Sudbury Dairy Co.'s premises, through which the members were allowed passage to Mr. Mynors' farm, an informal inspection was sanctioned through the kindness of the Manager (Mr. Tom C. Bates). It was regretted by some that a longer stay was not possible. The process of Derbyshire cheese-making was in full swing, and the visitors were shown some

sterilized milk which had been in bottles for about five years, the only notable sign of age being that the cream had become consolidated. Mr. Nuttall gave a short history of the place, which had been erected in 1881 under the direction of the grandfather of the present Lord Vernon. The sterilizing department was opened in 1898 with much ceremony, the Rt. Hon. Walter Long, Sir William Broadbent, and many distinguished medical men and scientists being present on the occasion. The object was to provide a milk supply absolutely free from tuberculosis. It was understood that the quantity of milk dealt with here each day was from 3,000 to 5,000 gallons. Again boarding the special train which had brought the party, the journey was completed to Uttoxeter, arriving there at 10 o'clock.

Reaching the Town Hall about 10-30, Mr. C. Sneyd Kynnersley, C.C., welcomed the Conference from the chair on behalf of the Uttoxeter Branch of the Staffordshire Farmers' Association. He said, although Uttoxeter was only a small town, it was essentially an agricultural one, all their industries being either connected with or dependent upon agriculture, so that there was a certain appropriateness in the visit of the British Dairy Farmers' Association, and the town fully appreciated the honour done them by the visit. No doubt there would be legislation on the milk question. The great majority of farmers used all reasonable care to ensure that their milk should reach the consumer in a clean and healthy condition, but there were a few farmers who required to be compelled to use more care than they did at present. Cowsheds, cattle, and the hands of milkers should be clean. With ordinary precaution there was practically no danger of milk getting contaminated while in the farmer's care. If the proposals which were made as to the grooming of cows, excessive air space in cowsheds, refrigerators on railways were adopted, such legislation could only have one of two results—either the consumer must pay a higher price for his milk, or the milk industry would be killed, which latter was rather an impossible idea. As the subject of the day's discussion was tuberculosis, he thought that where apparently healthy cows, after being purchased, were found to be tuberculous, and have to be slaughtered, the public should pay the compensation. He trusted that the result of the day's conference would leave them with a greater insight into the predisposing cause of tuberculosis and the means of its prevention, and of the purity of milk and its preservation. He was a member of the County Council, and had long been connected with the town by family ties, and he hoped that the British Dairy Farmers' Association would have a good time, and carry away with them some pleasant memories of their visit to the town and district.

Mr. A. C. Bunting also extended a welcome on behalf of the Uttoxeter Farmers' Association and Agricultural Society, and congratulated the British Dairy Farmers' Association on the good work it had done in the past in the interest of the dairy industry

of the country, and hoped that such a society as theirs would still thrive and continue was their hearty wish. Uttoxeter was surrounded by rich pasture land, and was a district especially adapted for the production of milk. No doubt the proposed legislation was under the consideration of the Society. He hoped the visit would be interesting to them and profitable to all engaged in agriculture, and again heartily welcomed the Conference to the ancient town of Uttoxeter.

The President acknowledged the welcome, and said he had motored from Derby that morning, and did not think he had seen a more perfect dairy country; the cow population seemed larger than in any other district in England. In connection with their efforts to promote instruction and knowledge in dairying, they had considered it desirable not to remain in any one particular district, but seek to interest farmers in different districts. The papers to be read were of the greatest importance to dairy farmers, and he hoped interesting discussions would arise. He again thanked the local gentlemen who had taken so much trouble to make their visit a pleasant one. He suggested that both papers should be read one after the other, and put it to those present that it should be so, but it was not thought wise to carry the suggestion through, as a large number of local representatives who were unable to be present in the morning were expected for the afternoon, and would not have an opportunity of hearing either of the papers read. That being so, it was decided to keep to the programme. The Chairman then called upon Mr. James Sadler to read his paper, viz. :—

HOW TO SECURE A MILK SUPPLY FREE FROM TUBERCULOSIS—FROM A PRACTICAL FARMER'S POINT OF VIEW.

By JAMES SADLER, Crewe.

So much has been written and spoken on the above subject during the last few years, and so rapid has been the development of public thought on the question, that it has been practically impossible for the ordinary dairy farmer to keep scope with the progress of events; and yet it is of the first importance to him, particularly if he be a milk-seller, that he should have at least an elementary knowledge of what his position is, so that he will be the better able to discharge not only his legal but also his moral obligations to the public.

It is not the object of this paper to discuss the question as to whether the consumption of milk from cows affected with tuberculosis can or cannot produce tuberculosis in human beings.

The experts are not yet fully agreed upon this point. That being so, it is incumbent on mere laymen like myself to stand aside while the experts fight this battle out among themselves, and arrive—as no doubt they will in due course—at some definite conclusion.

In the meantime, such legislation as has been proposed, and some of which has become law, has been based on the assumption that tuberculous milk can and does produce tuberculous disease in human beings, and ought not, therefore, to be permitted to be sold.

I will frankly admit that so long as there remains a reasonable doubt that such is the case, every effort should be made to prevent the sale of such milk, and I feel sure that every right-minded dairy farmer will be of that opinion also.

In approaching this question then as a dairy farmer, I venture to assert that no method of dealing with it, however perfect it may appear to be in theory, will be successful which does not command the loyal and hearty co-operation of those actually engaged in the business.

I venture to say, further, that any scheme which, in its practical working, would interfere to any serious degree with the cow population of the country, carrying with it the consequent reduction of our milk supply, would not only be foredoomed to failure, but would be disastrous from a public point of view, as it is coming to be recognised more and more every day that one of the primary necessities of the public is an adequate supply of fresh milk, and to reduce that supply by legislation would be to injure the community in a vital way. Therefore, however we may be attracted by ideal theories in dealing with this question, such as the immediate weeding out, by means of the tuberculin or any other well-recognised test, all cows that are in any way affected with tuberculosis, one feels that, without wishing for one moment to damp the ardour or check the enthusiasm of such idealists, we must of necessity be satisfied with less heroic measures, and make haste slowly, being content to leave to future reformers the task of dealing with those larger issues, which ought to be dealt with only when our knowledge is more definite, having been tested by exhaustive experiment.

Our business for the present is, as it appears to me, first, to ascertain what are the main sources of infection of milk with tuberculous germs; and, second, to remove those sources, or, if we cannot absolutely remove them, to minimise them as far as possible.

There are four possible sources of infection :—

- (1) The atmosphere in which the milk is produced.
- (2) The cow herself.
- (3) During transit.
- (4) Distribution.

Taking them in order, the first possible source has been so fully dealt with in the preceding papers that I need not do more than mention it, except to emphasize one or two points.

I am convinced that if our climate permitted, to keep the cows in the open-air, and milk them there, would speedily reduce the amount of tuberculosis in our herds. That, however, being impossible for practical reasons, we should aim at letting in upon our cattle, when housed, as much of the blessed sunlight as possible, for I feel sure my professional friends will agree with me when I say that light is the eternal enemy of tuberculous germs, as it is of large numbers of other evil things, which can only live and thrive in the darkness.

Coming next to the cow herself as the next possible source of infection, the question at once presents itself: How are we to discover the odd cow in the herd which is responsible for the contamination of the milk? I do not say that there is an odd cow in every herd by any means. There are many herds, and large ones, too, the milk of which as taken from the cows is absolutely free from tuberculosis, while at the same time there may be, and probably are a considerable number of those cows giving day by day perfectly sound milk, while they themselves are affected more or less with the disease.

If you apply the tuberculin test, you would throw out cows from the milk supply which would probably never give tuberculous milk during the whole course of their milking life. How is the farmer, for it is for him I speak, to detect the cow (where such an one exists) which gives tuberculous milk? There is nothing in the appearance, colour, taste, or smell of the milk to assist him. The cow herself may appear to be perfectly healthy, and even the udder, particularly in the earlier stages of the disease, presents no very striking indication of its presence. Again I ask, what is the farmer to do?

Well, according to our present public knowledge, a cow will only give tuberculous milk when she has developed disease of the udder; the whole of the legislation of recent years has been based upon that—up to now—admitted fact, so that the question is narrowed down to one point, but that point is a most difficult one to decide, because not only is it impossible for the farmer, but it is in many cases also impossible for even the most skilled veterinary surgeon to state with definite certainty whether a cow is or is not affected with this particular disease of the udder; but there are indications with which the experienced veterinary practitioner soon becomes acquainted, and where those indications are present action should be at once taken.

In order to get rid of these few doubtful cows, it will be clearly necessary to have systematic veterinary inspection of all cows kept for purposes of milk-selling; such inspection, to be satisfactory, must be carried out by the veterinary officers appointed by the Local Authority in whose district the cows are kept, and it should not be less than once in every six months. This system would at once give confidence to the health committees of the towns and cities to which the milk is sent for sale, while at the same time it

would release the farmer from the impossible position in which he finds himself under the present Model Milk Clauses, which require him to notify every such case which occurs in his herd, the alternative being prosecution and a penalty of 40s. and costs.

It would be quite consistent, with such a regulation as is here suggested, that the farmer should be required to notify to the Veterinary Inspector of the District any suspicious case that occurs between the Bi-annual inspection, but I do not think that any great need for this would arise. I have no hesitation in saying that every cow which shows symptoms of tuberculosis of the udder ought not only to be taken out of the particular herd in which she is found, but ought not to be permitted to continue her career as a milking cow at all; she should be slaughtered at once, as the only simple and effective way of cutting off that particular source of contamination.

This would undoubtedly mean that here and there a cow that was perfectly sound in the udder would be slaughtered, as even the ablest men are liable to mistakes, but a year or two of experience would reduce such mistakes to a minimum.

The question then obviously arises, who is to bear the loss of the slaughtered cow? My answer is, those in whose interest the cow has been slaughtered.

In the London County Council Act of 1904, which provided, for the first time in the history of this country, for the slaughter of cows showing symptoms of tuberculosis of the udder, with compensation on a perfectly equitable basis to follow (the terms of which, I have always been proud to think, I had the honour to help to arrange), the compensation in that case has to be paid by the people living within the London County Council area; and perfectly right that it should be so, because not only were the cows which produced the milk kept within that area, but every quart of the milk would be sold and consumed within the same area, so that they were the only people interested.

In the general case, however, one district is responsible for the production of the milk, and the people in another consume it. The only equitable way, therefore, is for the compensation for animals slaughtered in the public interest to be paid out of Imperial funds.

Agriculturists generally are agreed that the following terms of compensation after slaughter should be insisted on:—

If, on the post-mortem examination, the cow is found to be affected with tuberculosis of the udder, the owner will be paid three-fourths the value.

If, however, the result of the post-mortem examination is that the cow is not affected with tuberculosis of the udder, the owner will receive the full value, plus 20s. to cover the loss incident to the interference with his business.

I pass on to our third possible source of infection, viz., the period of transit.

Speaking generally, there are two ways by which milk is conveyed to market : first, for short distances, by cart ; second, for long distances, by rail. There does not appear to be any great risk of contamination where the milk is conveyed by cart, always provided that the cart is kept clean. The railway journey, however, presents more serious difficulties, and it would be futile to pay elaborate attention to the condition of the cowhouse and the health of the cow unless equal attention is paid to the conditions under which the milk is carried by rail. It is not fitting that I should do more than allude to the many ways by which contamination and injury to the milk of a serious kind may occur during the railway journey, but the time has come when the great railway companies, who draw large revenues every year from this particular traffic, should shoulder their responsibilities by providing specially constructed vehicles, kept clean and cool, properly ventilated, and subject to exactly the same inspection as is advocated, and in many cases already practised, in connection with our cowsheds and dairies, both in town and country.

If this were done, as it certainly ought to be, it would be safe to assume that when milk left the producer's premises in a sound and pure state it would arrive at its destination in the same condition ; at present no such assumption could be made.

Our next possible source of infection is in process of distribution. The distributor of milk has a rather hard row to hoe. He has to face day by day the critical public ; in many cases he gets his milk after a railway journey of anything from one to four hours, his customers all want it at once, and he would be only too glad to let them have it if he could ; the best he can do is to scurry round, lading, measuring, pouring out, and delivering, chiefly in small quantities, from door to door, and from street to street, time being of first importance. Under these circumstances, he is apt to forget the delicate nature of the article with which he is dealing, and, in so doing, neglects those precautions, elementary in their nature, which should be taken to protect his milk from contamination.

No one can pretend that the usual method of dealing from a wide-mouthed can, into which the measure is constantly being dipped, the vendor himself not being too careful about the condition of his clothes, is an ideal method ; not only are there opportunities in plenty of contamination in the process of delivery as sketched, but there is also the fact that the can-mouth, being constantly opened to take out the milk, is exposed to contamination from the atmosphere. The other method of delivery, by means of a tap, although much cleaner, is a dangerous one, as there is a very great likelihood that the first customers served would get more than their fair share of skim milk, while the last to be served would get more than their fair share of cream.

The only way, so far as I can see, to avoid the risk of contamination, which must accompany the open-mouthed can and

the frequent dipping, is that the milk should be bottled either at the farm or by the distributor, and here again we are immediately met by the question of cost. Whether the experiments which have recently been made with bottles of wood pulp, which are only used once as a milk vessel, and afterwards used for fire-lighting, will prove successful from an economic point of view experience alone will show; but, in the meantime, I see no reason why the milk retailer should not be required to wear a clean linen overall, with a macintosh in reserve for rainy weather, and thus reduce to a minimum the present risks of contamination.

I have tried to state briefly and clearly the several ways by which milk may be infected with tuberculous germs, and to suggest ways by which those sources of danger may be avoided. In conclusion, let me say that it is my opinion that every one of us, whether producers, carriers, or distributors, can, by paying more attention to the details of our share of the business, do something towards securing to the public what everybody feels to be so essential, a pure, sound, and wholesome milk supply; but the public must remember that all these things which are deemed to be necessary to bring about this result cost money, and it would be well for them to help to make it possible for these things to be done, by being prepared to pay a little higher price for the most valuable article of food which they take into their households.

Professor Nuttall, in proposing a vote of thanks to Mr. Sadler for his valuable paper, said a more sensible paper it would be impossible to conceive. Mr. Sadler had touched on all branches relating to tuberculous milk in a most able and plain manner. A great deal had been written in the press about milk being disastrous to infantile life in large centres. To make it quite clear, he stated the probability that the bulk of these infants did not die from the want of milk, but thought it was through the ignorance of people feeding their children on condensed milk, and to the way they administered it, which was equal to unintentional murder. If they were given a similar quantity of pure, fresh milk, it was very likely they would have lived. This so-called condensed milk was really separated milk condensed with about 48 per cent. of sugar. It might be stated that sugar was not harmful, therefore he again contended that it was due to the use of the dirty bottle, which had not been washed for a week, being filled with this condensed milk, and the infant had to suck it through a rubber tube. Therefore, these people must be educated to understand that there was very little support for children in such stuff. He again urged that condensed milk should be labelled: "Unfit for the food of infants."

Mr. Archibald MacNeilage (Glasgow), in seconding the vote, said the consumer of the milk would be the one whose word would prevail as to the conditions under which milk should be produced, and ultimately determine the law on the subject. In England they were anticipating legislation which had been in force in Scotland

for a quarter of a century, and for every vote the farmer had, the British public, who was a rather *stubborn animal*, had about ten. In fact, the proposed legislation seemed to be feared very considerably by the Conference. Professor Lloyd had stated earlier in the week that human tuberculosis and bovine tuberculosis were not the same, and that the former had never been known to be due to the latter. If Professor Lloyd and the gentlemen who agreed with him really believed that, let them, in the interests of the public, drench themselves with milk containing the germs of bovine tuberculosis, and thus demonstrate the sincerity of their belief. If they refused, they must pardon those who thought otherwise in the matter for declining to believe they had faith in that theory. The tuberculin test was open to great difficulty. The same reaction occurred where an animal was locally affected by the disease as if it was affected in a deadly form. Isolation and classification was better than the slaughter of suspected cattle, as advised by Mr. Sadler. As to air space, in Scotland that was left to the discretion of the local authorities.

Mr. John Pakeman, J.P., said he would be glad if the last speaker would state how he judged that the proposed English legislation would be identical to that already in force in Scotland.

Mr. MacNeilage stated he judged from deputations that had met the Local Government Board, not only from the British Dairy Farmers' Association, but of representatives of other associations as well.

Mr. Eldred Walker said that the application of the tuberculin test in Holland and Sweden had been attended with very good results.

The Rt. Hon. Jesse Collings, M.P., said he felt sure the suggestions which they agreed the previous day should be forwarded to the Local Government Board would be useful to the Board in framing their measure. No one knew what was in it, and no one would know until it appeared; there were, of course, some clever folks who thought they knew, at least the paragraph shown him by Sir George led one to suppose so, but that seemed to have been originated by the press. Mr. Sadler, in his paper, suggested a point which was most important, and was that the State should pay the full value of an animal killed and found to be free from tuberculosis, but if it was found to be affected after slaughter, then the state should pay three-fourths of its value. He preferred Sir George Barham's suggestion, viz., that if the animal were found to be free from tuberculosis the nation should pay its full value, but if, on the contrary, it was infected, then its value as a diseased cow should be paid to the owner. Hard and fast rules as to the payment of three-fourths of the cow's value would not be accepted by the Government. He hoped the Local Government Board would consider the suggestions sent up by such a practical body of men. He disagreed with Mr. MacNeilage that the consumer was the one whose word would prevail as to the conditions

under which milk should be produced, and ultimately determine the law on the subject. That might happen if all consumers were intelligent people, but the bulk of the consumers had formed no opinion whatever about it. In the matter of reforms, whether sanitary, educational, or notification of diseases, etc., these were always from practical and scientific men of a higher grade altogether, and the scientific man could alone determine the question whether or not the human being could contract consumption or tuberculosis from the milk of an affected cow, and therefore Professor Lloyd was quite right in not committing himself before they had more data to decide the point. Let the Conference send a resolution to the Local Government Board embodying the fact that compensation was a national matter, as suggested by Sir George Barham. When the nation interfered to compel a child to be educated, they found they had to pay for it. If a man was compelled, in the interests of the community, to have his cow slaughtered, the State, likewise, should pay for it.

Mr. John Lovatt (Uttoxeter) stated they were all very interested in the tuberculosis scare, for he believed it was nothing more. He had never missed drinking milk twice a day; probably it was tuberculous milk, as it came from all description of cows, but, if so, he had taken no harm. He suspected one of his cows to be suffering from tuberculosis, so got rid of her quickly without a warranty—(laughter)—and he believed that the gentleman who bought her soon sold her again. He had bought the cow and sold her again without warranty. Could anyone blame him for that, or was he to stand the loss of having her destroyed? This sort of thing would be done until the Imperial Exchequer or some national fund paid for tuberculous animals. They were, as a rule, sold to poorer men, and for that reason full compensation should be paid.

Mr. A. J. Mullins (Ansford), who represented the Somerset, Wilts, and Dorset Farmers' Association, considered there were three primary causes for tuberculosis: first, it was hereditary; secondly, it was due to the atmosphere in which cows were kept; thirdly, it was brought on by draughts causing a chill. Several farmers in his district he knew desired to improve the sanitation of their cowsheds, but the landlords, on being spoken to about such, reminded them that the tenant was liable for structural alterations. He thought landlords should be compelled to make those alterations.

Mr. Camillo Cerruti (Milan, North Italy) said he had joined the party to learn all he could about English dairying, as he had a small herd, and so far had been intensely interested in all he had seen and what he had heard. He thought the matter of selling and buying of animals should be conducted as in Italy in connection with horses, viz., a certificate of the condition of the animal, which, if proved to be incorrect, would cause proceedings to recoil upon the seller, and that principle might be very easily applied to cows sold in this country.

Mr. Sidney Villar (Consulting Veterinary Surgeon to the Association) said Mr. Sadler had written a most practical paper from a practical farmer's point of view. As to legislation on tuberculosis, "we must make haste slowly." There was a gentleman—he believed it was the Medical Officer of Health for Newcastle—who got his Council to believe that tuberculous animals could be slaughtered, and in this way the disease eradicated in a year. Any scheme such as that, which would interfere with the cow population of the country, would mean a reduction of our milk supply, which would be disastrous so far as the public were concerned. Therefore it was a most unsound proposition. As to Mr. Sadler's statement in his paper that cows kept altogether in the open air were free from tuberculosis, he pointed out that although this plan was followed to a large extent in New Zealand, tuberculous animals were still to be met with, so that sun and air space alone did not eradicate the disease. Mr. Sadler asked how a farmer was to detect an affected cow. Mr. Villar said it was not a difficult matter to detect the disease in the udder. Any cow which gave off the bacillus in her milk was so full of disease it was bound to show symptoms of illness, and as long as their cows presented a healthy appearance they need have no fear that they were sending tuberculous organisms out with their milk. He congratulated Mr. Sadler on his paper.

Mr. C. F. Thwaite (London) referred to the family of the late Queen Victoria, which he said had been reared on tuberculous milk. The herd from which the milk was taken consisted of 40 cows, which, on being tested with tuberculin, 38 responded and were destroyed. No case of consumption ever occurred in that family, nor amongst their children nor children's children.

Mr. Vernon B. Chalk (Beckenham) said that evidently Mr. MacNeilage was not acquainted with the internal organisms of the cow, or he would know that the cow's body contained the finest system of filtration organs that could be constructed. Was it possible for nature to construct a cow to feed her people and at the same time to use the milk for the purpose of destroying them? He could produce not only one family, but many, which had been brought up on milk taken from a cow proved to be far advanced in tuberculosis. As to the effect of sunlight on tuberculosis, in Iceland, where he had been, and other places also, the cows were practically shut up in the dark for two-thirds of the year in huts very deficient in air space, which had been so much talked of during the proceedings. If this combination of ill-conditions produced tuberculosis, how is it that the Icelanders multiplied instead of having become extinct?

Mr. Sadler said Mr. Lovatt's story of what happened when a man got hold of a tuberculous cow showed the great necessity for legislation, and he would be pleased to support Mr. Jesse Collings' suggestion, "that the farmer should be paid the carcase value of the cow destroyed if found to be infected," if that suggestion were

better than his own. Personally, he thought Mr. Collings' suggestion very unfair, because they would be destroying a cow of marketable value, and the farmer should be paid at least three-fourths of its value.

Mr. Jesse Collings contended he said that the State should pay what was declared to be its value as a diseased animal.

Mr. Sadler said, therefore, his proposal was more in the interests of the owner of cattle than was Mr. Collings'. If this matter went to the vote, he knew which way the vote would go.

Sir George Barham then moved the vote of thanks to Mr. Sadler, which was heartily endorsed, and stated that the Conference party were delighted to see so many local farmers there, and to know that the discussions were not confined entirely to the members of the Conference. He hoped to see them after lunch, when another paper on the same subject would be read by Mr. Sidney Villar (the Society's Consulting Veterinary Surgeon). About 200 persons partook of lunch, which was provided in a marquee erected in the croft adjoining the White Hart Hotel, many of the local representatives joining the party.

Again returning to the Town Hall, the following paper was read, viz:—

THE PREVENTION OF TUBERCULOSIS IN DAIRY CATTLE.

By SIDNEY VILLAR, F.R.C.V.S., Consulting Veterinary Surgeon to the British Dairy Farmers' Association.

For the purpose of discussing the means we should employ to prevent the existence of Tuberculosis in dairy cattle, it would perhaps be well in the first place to shortly state the nature of the disease and the method in which it spreads amongst cattle, and then to consider the more practical part of our subject, viz., its prevention or suppression in a dairy herd.

Tuberculosis, or consumption, is a contagious disease, due to a small living organism or germ, which, having gained access to an animal's body, multiplies in its organs and tissues.

Without the presence of this germ, known as "*Bacillus Tuberculosis*," no cattle, even the most weakly constitutioned, will develop Tuberculosis; but if this bacillus is present in a cowshed, even the strongest constitutioned animals are liable to become victims of the disease.

The usual means of entrance of the bacillus to the animal's body is through the mouth or nostrils.

In by far the greater proportion of diseased cattle the bacillus has gained its first entrance by the mouth; that is, the animal has taken it in with its food or water.

Congenital Tuberculosis in cattle, and by that is meant a calf affected with the disease when it is born, is extremely rare. In the Abattoir of Edinburgh only one case was found in five years,

although about 6,000 carcasses of young calves are examined each year; we can go farther even than this, and state that Tuberculosis is rarely found in calves under six months old.

Having gained access by the mouth or nostrils, the bacillus may become located and grow in almost any part of the body; we may find indications of its presence in the lungs, bowels, glands (or kernels), liver, udder, spleen, around the heart, in the uterus or calf-bed, and even in the joints and bones.

But in cattle which are young and strong, and particularly in those where there is no family predisposition to Tuberculosis, the animal's strength of constitution may overcome the activities of the bacillus, and it will recover from the disease. There is no doubt that an animal may, and in many cases does, make such a recovery.

In others the disease becomes latent or hidden in the body, the animal showing no indication of being diseased; but some unfavourable occurrence, such as taking a chill, having a bad time in calving, retention of the afterbirth, or excessive milking promoted by the inordinate use of brewers' or distillery grains and other milk-stimulating methods of feeding, will cause the animal's constitution to become weak, and enable the disease germs to get the upper hand; they will then rapidly multiply, the centres of the disease in the body will increase in numbers, and the cow will become feverish and evidently ill, developing what is known as Clinical Tuberculosis.

This is always accompanied with loss of flesh, frequently with rapid breathing and coughing, and later on with diarrhoea, and it may be with discharge from the breeding organs or with swelling of the throat or udder.

In an animal in this condition the lungs, bowels, or breeding organs, or it may be all of them, will be involved in the disease, and the germs of tuberculosis will be given off from these diseased parts in the act of coughing, with the diarrhoea, in the discharges from the breeding organs, and in some cases in the milk.

Sick cows with such symptoms are manufactories of tubercle germs, which they distribute all round them, contaminating drinking water and fodder, and even the air itself.

To such diseased animals the spread of Tuberculosis amongst a herd is due, and, bearing in mind that the swallowing or breathing in of germs so set free is the only method by which a healthy animal becomes affected with Tuberculosis, it is obvious that the first and most important consideration in the prevention of the spread of the disease to healthy cattle is the destruction of all animals which are disseminating the disease germs.

A cow affected with Clinical Tuberculosis should be got out of the herd, isolated, or destroyed, with the same amount of dispatch that we should remove a glandered horse from a stud.

The cowkeeper may have taken steps to secure the proper lighting, ventilation, cleansing, draining, water supply, and air space in his cowshed, but as long as he permits a cow clinically

affected or visibly ill with Tuberculosis to remain in it, even for a few hours, he will never get tuberculosis out of his herd.

Besides absolute recovery or the development of fatal Clinical Tuberculosis, there is a third course which this disease often takes in the animal's body.

In many cows, indeed in most cows, which are well cared for, not excessive milkers, and which are lucky enough to escape the ordinary accidents of life, the latent or hidden disease, although always present, does not take on activity or develop during several years, and the cow is fatted off or dies from some other disease without any evidence of Tuberculosis being observed during her life, unless its existence has been discovered by the use of the tuberculin test.

Having got rid of the clinically diseased cow, the next step for the prevention of the spread of the disease is to thoroughly disinfect the cowshed.

All food which the sick animal may have breathed upon, and all her bedding and dung, should be burnt. The mangers, both inside and out, the wooden partitions, the walls, and the floor should be lime-whited with hot lime, containing a pint of crude carbolic acid to each pailful of limewash. In the case of iron or glazed mangers or partitions, thorough washing with boiling water and dousing with strong carbolic solution must be insisted upon.

After this is done, expose the building or stall as much as possible to the open air for some days before it is again occupied.

In passing, it may be remarked that a common drinking place for all the cows of a herd, unless it is a running stream, is a source of danger, as the water may be contaminated by a diseased animal; cases are on record, also, where the herbage of a small field has become so contaminated by a sick cow as to infect other animals grazing in the same enclosure.

The next point for the suppression of the disease is to deal with the cows which have been exposed to infection by the clinically diseased animal.

All cows which have been in contact, and this means all animals in the same shed or field, should be tested with tuberculin, and a private mark put on the horn or ear of all which react to the test. The ideal course to pursue would then be to permanently remove all the cattle which did not react to a healthy shed or pasture, but this would often be attended with almost unsurmountable difficulties; failing this, if the number of reacting cattle is small (unfortunately it is usually quite 30 per cent., and in very large herds an even higher percentage), they may be removed, allowing only those which pass the test to remain.

In most cases, however, the healthy and reacting must, from force of circumstances, remain together in the same shed or pasture, but the owner, having his private mark on the horn or ear of reactors, knowing that these cows may become a danger at any time, must always be suspicious of them, and be on the look out for any sign

of illness, loss of condition, or cough, and at once isolate the animal, cleanse and disinfect her standing and immediate surroundings, and await developments.

It is advisable to repeat the first testing with tuberculin after an interval of three months.

In all respects, except increased surveillance, the non-reacting and reacting cows should be treated alike.

The milk of reactors which do not show clinical symptoms of the disease can be used with absolute safety both for man and beast.

New animals should be put into another shed, or the original shed partitioned off, and they should be placed only with cows which have satisfactorily passed the test, for, as we have seen, the spread and continuance of the disease depend upon putting susceptible young cattle into infected herds and healthy heifers amongst diseased cows.

To sum up, I maintain :—

1. That clinically diseased cows should be isolated and slaughtered.

2. That in contact cows should be tested and watched with great care.

3. That healthy young animals should not be put into sheds where the disease is known to exist.

If all clinically tuberculous cows are quickly slaughtered, and efficient disinfection carried out, we shall within two or three years have an extraordinary diminution in the number of cows which react to the tuberculin test; instead of 30 per cent. of the cows in a shed, it will nearly approach only 3 per cent.

There will never be any cases of tuberculous udders to notify, because affected cows will be destroyed before the disease reaches the udder.

For a cowkeeper to carry out my suggestions he would need great determination, and must be prepared to expend much time and trouble, and, above all, it would entail considerable expense.

If the eradication of this disease in cattle is necessary for the public good, it is only just that compensation should be paid out of the public funds for slaughtered animals, for the cost of disinfection, and for the supply of tuberculin.

For such paying out of public funds legislation would be necessary, and it is a fundamental point which must always be borne in mind, that no scheme of legislation for the eradication of any cattle disease is of any use which does not secure the willing co-operation of agriculturists.

Another point which must not be forgotten is that, although cattle tuberculosis is most prevalent in dairy cows, the disease is not by any means confined to this class of cattle; young store stock, steers, dry cows, and bulls all sometimes develop Clinical Tuberculosis, and become a danger to healthy cattle.

So that for the eradication of Tuberculosis in dairy cows, legislation, if confined to cows alone, would be insufficient ; all other classes of cattle must be included.

I respectfully suggest that the proper course to adopt would be to schedule Clinical Tuberculosis in all classes of cattle under the Diseases of Animals Act.

This could be done by the Board of Agriculture making a Clinical Tuberculosis Order on somewhat similar lines to their Glanders Order which came into force on 1st January of this year.

Such Order provides for some compensation being paid for all diseased animals slaughtered, and for the full value of the animal being paid if, on post-mortem examination, it is found to be free from the disease.

Provision is also made for dealing with suspected cases, and for preventing the sale of diseased animals.

In London and some of the surrounding districts the provisions of the Glanders Order are carried out by the professional officials of the county councils, practically without the aid of the police.

In London, if the owner of a diseased horse gives notice to the Veterinary Inspector of the County Council, it is a sufficient notice. The advantages of this are obvious : there is not the publicity which is caused by the presence of a policeman in uniform upon or at the gates of the premises ; the owner or his servants are not put through inquisitorial examinations by persons unacquainted with the subject ; and the owner is, or should be, throughout treated as an individual who has met with misfortune, and not as a culprit.

Owing to the increase of education generally, to the good work of our agricultural colleges and societies, to the foresight of the Board of Agriculture in issuing technical leaflets and journals, the dairy farmer of to-day has far greater knowledge of the incidence of disease, and recognises the necessity of its suppression better than did his predecessor of even a generation ago.

If the goodwill of the dairy farmer is secured by giving him credit for such knowledge, by carefully considering the welfare of his business, and awarding adequate compensation for his slaughtered cattle, he would willingly co-operate with the Board of Agriculture in the eradication of Tuberculosis from our dairy herds. Under such circumstances the provisions of a Clinical Tuberculosis Bill would not be difficult to carry out, and would rapidly be attended with great benefit both to the general public and the cattle owner.

Mr. G. Fletcher Bagshaw proposed a vote of thanks to Mr. Villar, who, he said, had dealt with a subject in which farmers all over the country were interested. Such Conferences as this would do a great deal of good, as it would set people thinking over what they had heard. He believed he could say that the main object and desire of the farmers in that district was to keep their herds free from tuberculosis, and to send a pure supply of milk to their town customers.

Mr. J. F. Blackshaw, in seconding the vote of thanks, said he should liked to have heard a third paper on the prevention of tuberculosis in the human subject, from a common-sense point of view. He did not think it fair, so he entirely disagreed with any statement of medical authorities, that the cow was the only source of infection of that dread disease. He believed that the tuberculous organisms were very widely distributed, and the infection might be got from many sources. Its development depended largely on the constitution of the subject and the surroundings. Nature had provided a systematic set of organs to battle against disease, but these allies could only act effectively where the subject was healthy. He agreed that a great deal of mischief was caused by children not having sufficient milk, which contained in its actual constituents digestive matter in quantity designed to strengthen the system. Sterilized milk and condensed milk were bad for children, as in heating it lost its digestive power.

Mr. John Brown said that in Tunbridge Wells the medical officer of health had reported that no deaths had been traced to improper feeding, which illustrated that where a good and plentiful supply of milk was obtainable the infant population thrived.

Mr. F. J. Lloyd thought there was considerable prejudice in the country against the use of one of the most valuable means at the disposal of the farmer to help him to eradicate this disease from his herd that had been discovered, viz., inoculation with bovo-vaccine, which rendered calves immune to tuberculosis. Investigations had been made abroad not merely with a view to eliminate already existing disease, but to raise up a new stock. That was the most scientific and best way for farmers to protect themselves against this disease. Inoculation of calves had been made with bovine and human bacillus, and it had been proved that they were entirely distinct. The farmer would have to use this means if the Government put stringent law into operation, and it would be paid for out of the pockets of the owners. If the Government were asked to pay compensation, they would say: "You have no right to sell to the public anything injurious to health, and therefore cannot expect to recover any loss you may incur to get rid of the disease." He maintained that there was no scientific proof that tuberculosis in human beings was caused by milk, and until those who made such statements—that the disease in human beings was caused by milk—had scientific proofs in support of their assertions, they had no right to call on him "to drench himself with tuberculous milk" to show that they were wrong. The system which would be adopted in future would be examinations by qualified bacteriologists, who would have the power to condemn milk containing tuberculous bacteria. He thought the Board of Agriculture might assist farmers in many ways, and supply them with tuberculin, and that the Government should carry out experiments in regard to inoculation, so that they in England might have some data to go upon as to its success or

otherwise. Whatever legislation took place, it must apply to the whole country. If it were confined to London, all tuberculous cows in the Metropolis would be sent into country parts, which would become centres of the disease.

Mr. J. B. Ellis said he would be glad to be informed what was to be understood as having happened in the case of cows which, say, after an interval of three or four months did not re-act?

Mr. Villar replied that if after three to six months the disease did not react, it was one of those cases in which absolute recovery had taken place.

Mr. Thomas Stone (London) stated he was encouraged by the fact that in the last ten years the consumption of milk in London had greatly increased, while at the same time tuberculosis in human beings had decreased. His wife had brought up a family of ten, and they were all strong, healthy, well-developed, young men and women, and he attributed this to the free use of milk, which had always its allotted place on their sideboard, and had been used without fear.

Mr. Simon Blore (Rugeley) wondered why bulls which did not pass the test for export were frequently bought by farmers for less money, and asked if there was any danger from hereditary disease.

Mr. Villar replied that there would be great danger that such bulls would infect the cows.

Mr. Simon Blore: Then I should like to know why an Englishman should buy a bull that the foreigner and the Colonial would have nothing to do with? With regard to compensation, he pointed out that at present the only disease compensated for out of the Imperial funds was rinderpest, and to bring in other diseases under the same scheme would necessitate a special Act of Parliament.

Mr. Villar remarked that Professor Lloyd seemed to wonder that he did not mention the vaccination carried out on the Continent with the idea of rendering calves immune from tuberculosis. These experiments were also being conducted in South America, but were yet too nubelous to be considered that day. He was disappointed somewhat whenever he heard foreign countries held up as an example to this country. He had been in Switzerland, and he could say, after a long experience of cowsheds in England, that he never saw anything here approaching the insanitary conditions which exist in some of the sheds in Switzerland. In fact, England was far ahead of Continental nations in such matters.

Sir George Barham said they were all delighted to hear such interesting discussions, and thanked Mr. Villar for his attention. He said the majority were aware of the resolutions which have been passed at the various meetings during the Conference proceedings, and before we conclude the business portion he should like to put them all again to this large gathering (which is the largest of the week) to show that the districts visited have been unanimous in their support, and that they have not been confined

to single places. With regard to resolution No. 3, he would like to point out once more his contention was that in the case of all animals which were compulsorily slaughtered full compensation should be paid. That was Mr. Jesse Collings' contention also, but Mr. Sadler said three-fourths; but why not the other fourth? The cow was of more value than its hide if sent to market—as it was to their friend Mr. Lovatt. The resolutions as follows were then put separately to the meeting, and each was carried:—

1. That the enforcement of any new regulations in respect of farms and farm buildings should be in the hands of the Board of Agriculture.

2. That in view of the fact that the regulations about to be imposed upon the producers in this country cannot be enforced in the case of milk produced in foreign countries, the importation of such milk should be prohibited.

3. That in order to secure the co-operation of the owners of stock, full compensation be paid for all animals compulsorily slaughtered, on the basis of the declared value before slaughter, such compensation to be paid out of the Imperial funds.

4. That as it has been shown that a large percentage of infantile mortality is due to insufficient nourishment arising from the use of condensed skimmed milk, it is desirable that a standard should be fixed by the Board of Agriculture for condensed milk.

5. That all condensed milk which in its preparation has been skimmed, separated, or deprived of any portion of its butter-fat, should be marked in large letters "UNFIT FOR THE FOOD OF INFANTS."

6. That in view of the many mis-statements which have been published in connection with infantile mortality in its relation to the milk supply, this Conference is of opinion that the attention of the public should be drawn to the fact that infantile mortality is greatest where the consumption of fresh cows' milk is smallest.

7. That this Conference considers the fixing of a definite air space in cowsheds both unscientific and impractical. If such definite air space is demanded, this Dairy Conference is in accord with the resolution passed at the International Congress of Dairying at the Hague in 1907, that such limit should only apply to sheds built after the passing of the regulation.

8. That whatever standard of cleanliness may be deemed necessary for milk, such standard should be fixed for the whole country by the Local Government Board, and not left to the discrimination of local authorities.

9. That representations be made to the Board of Agriculture with a view to securing the provision of a supply of tuberculin of guaranteed strength to Veterinary Surgeons for the use of farmers and owners of cattle free of charge.

The resolutions were ordered to be forwarded to the Presidents of the Local Government Board and the Board of Agriculture.

Sir George then thanked the delegates for the able manner in which they had carried on the business, and referred with appreciation to the fact that the Rt. Hon. Jesse Collings, in spite of his many engagements, had been able to spend several days at the Conference. He also acknowledged the able and successful manner in which Mr. W. C. Brown, the Chairman of the Conference Committee) had carried out the arrangements, which had entailed a considerable amount of hard work, and he recognised the efficient

way in which the Assistant Secretary of the Association had performed the arduous duties in connection with the Conference which were so suddenly placed upon him.

Mr. Thomas Nuttall moved: "That a hearty vote of thanks be accorded to the President for the conduct of the proceedings throughout the Conference." This was seconded by Mr. John Pakeman, supported by Mr. Jesse Collings, and carried with acclamation.

A visit was subsequently paid to the agricultural implement works of Messrs. Bamford and Sons, which extend over twenty-two acres of ground. Here the men had been kept on overtime in connection with the visit, which was thoroughly interesting, and the different kinds of farm machinery and their process of manufacture were well demonstrated, and discussed by the members. The party then caught the 6-19 train to Ashbourne, putting up at hotels there.

FOURTH DAY'S PROCEEDINGS.

At 9 a.m. on Friday morning congenial springtime weather greeted the party as the special train was boarded for Hartington. Arriving there in 25 minutes, carriages which were in waiting conveyed the members to Hartington village, where Mr. J. M. Nuttall's Stilton cheese dairy is situated. It was understood that about 25 farmers send in from 800 to 1,000 gallons of milk per day from April until September, from which about 7,000 Stilton cheeses are made. It is unnecessary to describe the quality of such cheeses, if one has had any experience of the London Dairy Show, where success has been gained more often than not. The process of manufacture of the cheese at different stages was demonstrated to the visitors, who had the opportunity of tasting the curd and also the finished cheese. Many questions were asked relating thereto, and were patiently answered. The whey is utilised, with Indian meal and wheat meal, to feed a large number of pigs which are kept. These were located in small pens, where the floors were of stone, sloping down to the gutter, thus allowing them to be easily and effectively cleaned. No bedding of straw or any other material is given the pigs, and their healthy appearance and clean state bore out the owner's remark, that they seemed to thrive, nevertheless. With cheers, the party drove away, and proceeded through beautiful country to Hulme End, the terminus station of the Leek and Manifold Valley Light Railway. This railway is nine miles in length, and gives access to one of the loveliest and least-known valleys in Staffordshire. Each train carries its own station master and ticket collector, and travels at 12 miles per hour. From the railed platform of the cars the passengers were afforded the pleasure of seeing the picturesque scenery through which the railway curves and climbs.

Arrived at Waterhouses the journey was continued in brakes to the pretty village of Ilam, where all dismounted to visit the grounds of Ilam Hall, where, with heads bare, they gathered round the tomb of the late Rt. Hon. R. W. Hanbury (once President of the Board of Agriculture). Leaving this charming village behind, the brakes mounting the hills soon came in sight of the Izaak Walton Hotel, which stands in its own grounds of 100 acres adjoining the southern entrance of Dovedale. Here luncheon was served at 1 p.m., after which the party proceeded on foot through the famous Dale. The stepping stones were soon reached, and then, bearing to the left, Reynard's Cave, one of the most curious specimens of rock scenery in Derbyshire, was seen; then the Lion's Head, a singularly shaped rock resembling the head of that animal. "The Grey Mare's Stable," "Ilam Rock," "Dove Holes," and "The Steeples" were commented upon, and a group of rocks called "Tissington Spires" roused exclamations of admiration from the party. Retracing the path to the stepping stones previously mentioned, the journey was continued up the opposite portion of the Dale to the Peveril of the Peak Hotel at the summit. Here tea was served at 4-15 p.m., after which, again mounting the brakes, the journey was resumed by way of Spen Lane, Mappleton, through Okeover Park, where cattle and deer grazed side by side, and a call was made at Mr. George Peach's dairy farm, whose herd of cattle was inspected in the fields. Thence onward to Clifton, where permission had been kindly granted the party by the Mayfield Dairy Association to view their premises, where Derbyshire cheese making is conducted. Only a brief stay was made, which was ample for the visitors to see into the process of manufacture as carried out there and to sample a very good specimen. Another call was made at Mr. Wm. Nuttall's Stilton cheese dairy, where a further insight into the process of its manufacture was obtained. The party were then conveyed to their respective hotels in Ashbourne. At 7 p.m. the members dined together at The Hall Hotel, which was formerly the country seat of the famous family of Cokayne.

The Chairman of the Conference (Mr. W. C. Brown) presided, and he proffered the loyal toasts, which were enthusiastically honoured. During the evening he also proposed the health of those noblemen and gentlemen who had opened their establishments and so heartily welcomed the Conference.

FAT IN MILK:

RECORDS MADE AT THE BRITISH DAIRY INSTITUTE.

The following figures are a continuation of those given in Vol. XXII. of the fat percentages of morning and evening milk supplied to the British Dairy Institute, Reading, during the year 1908.

Mr. Lousley's herd still consists of about 40 Shorthorn cows, with the addition of one Jersey to every six or eight Shorthorns. The milking hours are at 5 a.m. and 3 p.m. respectively. During summer, when the cows are on grass, they receive about 4lbs. of cotton cake per head per day. In winter the food consists of about two loads of pulped mangolds per day, and hay and straw chaff, with about 6lbs. of a compound meal for each animal. The soil of the farm is heavy loam on a clay subsoil. The meadows are on high ground, and have mostly been laid down within the last 30 years. Some of the meadows are watered by a running stream, and others from a reservoir by pipes connected with the drinking troughs.

The herd of the University College Farm, Reading, consists of 11 Shorthorns, and milking takes place at 5-30 a.m. and 3-0 p.m. respectively. In summer the cows are on the pastures, and receive no artificial food. During the autumn and winter they receive 6lbs. of mixed decorticated and undecorticated cotton cake, with the addition in the autumn of cabbage, green maize, and kohl rabi, and mangolds in the winter. The farm is on the London clay, and the soil somewhat stiff. At the farm buildings the water is supplied by the Reading mains.

	Milk from Mr. Lousley		Milk from University College Farm	
	DAILY		DAILY	
	Morn.	Even.	Morn.	Even.
February 1	3.6	4.4	3.5	3.9
3	3.8	4.3	3.6	3.7
4	3.6	4.4	3.8	4.0
5	3.6	4.2	3.9	3.5
6	3.6	4.0	3.5	3.7
7	3.7	4.3	3.5	3.8
8	3.7	4.2	3.7	4.1
10	3.8	4.2	3.6	3.6
11	3.9	4.0	3.7	3.8
12	3.5	4.0	3.7	3.5
13	3.5	4.3	3.6	3.9
14	3.9	4.1	3.8	3.7

		Milk from Mr. Lousley		Milk from University College Farm	
		DAILY		DAILY	
Feb. (Cont.)		Morn.	Even.	Morn.	Even.
15	.....	3·7	4·1	3·5	4·0
17	.....	3·5	4·2	3·6	3·6
18	.....	3·6	4·1	3·6	3·9
19	.....	3·4	4·2	3·7	3·5
20	.....	3·7	4·0	3·7	3·8
21	.....	3·7	4·2	3·7	3·7
22	.....	3·7	4·2	3·8	3·8
24	.....	3·6	4·5	3·6	3·6
25	.....	3·9	4·4	3·9	4·0
26	.....	3·6	4·3	3·8	3·8
27	.....	4·0	4·2	3·9	4·2
28	.....	3·5	4·5	3·8	4·0
29	.....	3·8	4·1	4·0	4·1
March					
2	.....	3·6	4·1	4·0	3·9
3	.....	3·8	4·5	3·9	4·1
4	.....	3·8	4·1	3·8	3·9
5	.....	4·0	4·2	3·9	3·9
6	.....	3·9	4·1	4·0	4·1
7	.....	3·9	4·2	3·7	4·0
9	.....	3·7	4·6	3·7	3·8
10	.....	4·0	4·3	3·8	4·0
11	.....	3·8	4·5	4·0	3·8
12	.....	3·6	4·2	3·9	3·9
13	.....	3·8	4·2	3·9	4·1
14	.....	3·8	4·4	3·9	4·1
16	.....	3·8	4·4	3·7	4·0
17	.....	3·9	4·2	3·8	4·1
18	.....	3·9	4·4	3·8	3·7
19	.....	4·0	4·2	3·9	4·0
20	.....	3·7	4·4	3·8	3·9
21	.....	4·1	4·5	3·8	4·0
23	.....	3·4	4·2	4·1	3·9
24	.....	4·0	4·3	4·0	4·1
25	.....	4·0	4·3	3·9	4·1
26	.....	3·8	4·1	3·9	3·9
27	.....	3·3	4·5	4·0	4·1
28	.....	3·5	4·2	3·8	4·4
30	.....	3·7	4·2	3·8	4·0
31	.....	3·9	—	4·0	—

		Milk from Mr. Lousley		Milk from University College Farm	
		DAILY		DAILY	
April		Morn.	Even.	Morn.	Even.
1	....	4.0	4.2	4.1	3.9
2	....	3.7	4.2	4.0	4.1
3	....	3.8	4.2	4.0	4.0
4	....	3.4	4.1	3.8	4.2
6	....	3.5	4.1	3.7	3.7
7	....	3.5	4.0	4.4	3.8
8	....	3.7	4.0	4.3	4.0
9	....	3.6	4.1	4.1	3.7
10	....	3.9	4.0	4.2	3.7
11	....	3.7	4.6	4.0	4.0
13	....	3.5	4.2	3.6	3.9
14	....	3.6	4.1	4.3	4.0
15	....	4.0	4.6	4.1	4.0
16	....	3.7	4.2	4.0	4.0
17	....	3.6	4.1	3.9	4.0
18	....	3.5	4.2	3.6	3.8
20	....	3.4	4.5	3.9	4.2
21	....	3.4	4.2	4.1	4.1
22	....	3.7	4.3	3.7	3.8
23	....	3.4	4.4	4.0	4.2
24	....	3.7	4.5	4.0	4.4
25	....	3.6	4.6	4.1	4.2
27	....	3.6	4.2	4.0	4.0
28	....	3.6	4.6	3.9	4.0
29	....	3.5	4.5	4.0	4.0
30	....	3.4	4.4	4.1	4.1
May					
1	....	3.3	3.8	3.9	3.7
2	....	3.6	4.0	4.0	4.0
4	....	3.0	4.5	4.2	3.9
5	....	3.4	4.6	4.1	4.2
6	....	3.7	4.2	4.0	4.5
7	....	3.7	4.6	4.2	4.5
8	....	3.6	4.6	4.1	4.3
9	....	3.7	4.3	4.1	4.2
11	....	3.6	4.3	3.9	3.9
12	....	3.6	4.5	4.0	4.2
13	....	3.2	4.3	3.3	4.4
14	....	3.6	4.2	3.8	3.7
15	....	3.2	4.3	3.6	4.1
16	....	3.5	4.0	3.9	4.4
18	....	3.3	3.8	3.7	3.7
19	....	3.3	4.3	3.8	3.6

		Milk from Mr. Lousley		Milk from University College Farm	
		DAILY		DAILY	
May (Cont.)		Morn.	Even.	Morn.	Even.
20	....	3.1	4.5	4.0	3.9
21	....	3.3	4.4	3.9	4.5
22	....	3.6	4.7	3.7	4.5
23	....	3.3	4.4	3.7	4.5
25	....	3.2	4.4	3.6	3.5
26	....	3.3	4.5	3.7	4.6
27	....	3.4	4.5	3.6	4.9
28	....	3.6	4.6	3.7	4.3
29	....	3.3	4.5	3.5	4.0
30	....	3.6	4.3	3.7	4.1
June					
1	....	3.6	4.2	4.4	3.9
2	....	3.1	4.2	3.6	4.2
3	....	3.7	4.1	3.7	4.5
4	....	2.9	4.3	3.3	4.0
5	....	3.5	4.7	3.7	4.6
6	....	3.6	4.5	3.7	4.5
8	....	3.5	4.3	3.5	4.3
9	....	3.5	4.4	3.6	4.1
10	....	3.4	4.0	3.6	4.1
11	....	3.7	4.7	3.5	4.3
12	....	3.3	4.3	3.7	4.3
13	....	3.3	4.2	3.6	4.6
15	....	3.4	4.2	3.6	4.1
16	....	3.5	4.2	3.5	4.2
17	....	3.3	4.5	3.5	4.4
18	....	3.4	4.5	3.5	4.5
19	....	3.4	4.4	3.8	4.4
20	....	3.8	4.4	3.9	4.0
22	....	3.3	4.6	3.6	4.4
23	....	3.5	4.6	3.6	4.4
24	....	3.5	4.1	3.6	4.0
25	....	3.8	4.7	3.7	4.3
26	....	3.6	4.2	3.6	3.8
27	....	3.5	4.3	3.6	4.2
29	....	3.4	4.2	3.4	4.4
30	....	3.8	4.1	3.9	4.4
July					
1	....	3.5	4.4	3.6	4.4
2	....	3.3	4.0	3.7	4.1
3	....	3.6	4.6	3.6	4.5
4	....	3.6	4.2	3.8	4.3
6	....	3.7	4.2	3.6	4.1

	Milk from Mr. Lousley		Milk from University College Farm	
	DAILY		DAILY	
July (Cont.)	Morn.	Even.	Morn.	Even.
7	3.7	4.6	3.4	4.9
8	3.7	4.1	3.9	4.7
9	3.3	4.5	3.4	4.5
10	3.9	4.6	3.6	4.7
11	3.6	4.5	3.5	4.8
13	3.8	4.7	3.6	4.6
14	3.7	4.2	4.0	4.6
15	3.4	4.5	3.6	4.5
16	3.7	4.4	3.8	4.8
17	3.8	4.5	3.9	4.7
18	3.5	4.5	3.6	4.4
20	3.6	4.4	3.7	4.6
21	3.3	4.1	3.7	4.5
22	3.6	4.3	3.8	4.0
23	3.6	4.2	3.8	4.4
24	3.5	4.2	3.8	4.2
25	3.5	4.8	3.6	4.7
27	3.9	3.9	3.8	4.4
28	3.8	4.4	3.7	4.3
29	3.5	4.3	3.7	4.2
30	3.3	4.4	3.5	4.2
31	3.8	4.5	3.5	4.2
August				
1	3.6	4.1	3.7	4.5
3	3.6	4.9	3.5	4.3
4	3.0	4.3	3.5	4.3
5	3.3	4.7	3.4	4.4
6	3.5	4.0	3.4	4.4
7	3.1	4.4	3.5	4.1
8	3.5	4.1	3.6	4.3
10	3.4	4.0	3.3	3.9
11	3.7	4.3	3.5	4.5
12	3.3	3.9	4.2	4.1
13	3.6	4.3	3.1	4.1
14	3.2	3.9	3.8	4.5
15	3.1	4.4	3.3	4.5
17	3.5	4.1	3.5	4.1
18	3.4	4.4	3.5	4.1
19	3.5	4.1	3.5	4.5
20	3.1	3.9	3.2	4.7
21	3.4	4.2	3.6	3.7
22	3.2	3.9	3.4	4.5
24	3.2	4.1	3.7	4.1
25	3.4	4.3	3.1	4.8

	Milk from Mr. Lousley		Milk from University College Farm	
	DAILY		DAILY	
August (Cont.)	Morn.	Even.	Morn.	Even.
26	4.0	4.1	3.4	4.7
27	3.4	4.2	3.3	4.7
28	3.7	4.2	3.4	4.7
29	3.5	4.0	3.5	4.0
31	3.4	4.4	3.5	4.4
September				
1	3.2	4.4	3.2	4.3
2	3.5	4.3	3.2	4.5
3	3.5	4.4	3.3	4.5
4	3.6	4.3	3.3	4.4
5	3.9	4.1	3.2	4.5
7	3.6	4.5	3.4	4.4
8	3.7	4.5	3.6	4.9
9	3.6	4.1	3.9	4.2
10	3.9	4.0	3.5	4.7
11	3.9	4.6	3.2	4.2
12	3.6	4.5	3.5	4.9
14	3.4	4.1	3.7	4.6
15	3.7	4.3	3.5	4.8
16	3.9	4.5	3.4	4.6
17	3.7	4.7	3.7	4.3
18	3.7	4.1	3.5	4.4
19	3.4	4.1	3.5	4.7
21	3.2	4.7	3.4	4.8
22	3.6	4.4	3.5	4.6
23	3.7	4.7	3.4	4.7
24	3.3	4.8	3.4	4.4
25	3.5	4.3	3.4	4.6
26	3.8	4.2	3.4	4.2
28	3.1	3.9	3.5	4.4
29	3.0	4.2	3.3	4.2
30	3.7	4.5	3.3	4.7
October				
1	3.9	4.1	3.6	4.5
2	3.7	4.0	3.5	4.2
3	3.5	4.4	3.3	4.1
5	3.4	3.8	3.3	4.4
6	3.1	4.5	3.0	4.3
7	3.3	4.4	3.1	3.2
8	3.5	4.0	3.5	4.2
9	3.6	4.4	3.2*	4.6
10	3.4	4.4	3.2	4.4

October(Cont.)	Milk from Mr. Lousley		Milk from University College Farm	
	DAILY		DAILY	
	Morn.	Even.	Morn.	Even.
12	3.2	4.4	3.4	4.3
13	3.5	4.3	3.1	4.3
14	3.6	4.4	3.3	4.3
15	3.4	4.0	3.3	4.3
16	3.5	4.4	3.4	4.1
17	3.1	4.1	3.3	4.1
19	3.0	4.0	3.2	4.1
20	3.3	4.5	3.3	4.4
21	3.1	4.2	3.3	4.4
22	3.3	4.3	3.1	4.4
23	2.7	4.1	3.2	4.0
24	3.1	4.5	3.3	4.2
26	3.0	4.3	2.6	4.3
27	3.1	4.1	3.7	4.4
28	3.2	4.3	3.2	4.5
29	3.3	4.4	3.3	4.3
30	3.2	4.5	3.3	4.1
31	3.3	4.2	3.3	4.5
November				
2	3.1	4.3	3.5	4.4
3	3.4	4.6	3.7	4.5
4	3.0	4.3	3.3	4.6
5	3.5	4.5	3.5	4.4
6	3.6	4.4	3.3	4.6
7	3.4	4.0	3.3	4.6
9	3.6	4.4	4.1	4.8
10	3.5	4.7	4.0	4.5
11	3.5	4.5	4.0	4.4
12	3.6	4.2	3.5	4.2
13	3.4	4.4	3.4	3.9
14	3.6	4.6	3.6	3.8
16	3.6	4.5	3.4	4.1
17	3.6	4.6	3.5	4.2
18	3.7	4.2	3.4	4.2
19	3.4	4.4	3.3	4.1
20	4.0	4.2	3.3	3.6
21	3.7	4.2	3.2	4.5
23	3.8	4.5	3.5	4.1
24	3.6	4.5	3.7	4.3
25	3.9	4.6	3.7	4.3
26	3.8	4.3	3.8	4.3
27	3.9	4.5	3.9	4.0
28	4.0	4.6	3.6	4.0
30	3.6	4.4	3.7	4.3

December		Milk from Mr. Lousley		Milk from University College Farm	
		DAILY		DAILY	
		Morn.	Even.	Morn.	Even.
1	....	3.6	4.6	3.5	3.8
2	....	4.0	4.9	3.5	3.9
3	....	4.4	4.7	3.7	4.6
4	....	3.8	4.9	3.7	3.9
5	....	4.2	4.5	3.0	4.1
7	....	4.1	4.8	3.3	4.4
8	....	4.3	4.9	3.5	4.2
9	....	4.3	4.4	3.9	4.1
10	....	4.0	4.9	3.5	4.2
11	....	4.2	4.6	3.8	3.8
12	....	3.7	4.0	3.4	4.7
14	....	3.4	4.4	3.6	4.4
15	....	3.6	—	3.8	—

THE FAT PERCENTAGE BY ANALYSES OF DUPLICATE SAMPLES OF
INSTITUTE'S MILK SUBMITTED TO F. J. LLOYD, F.C.S.,
CONSULTING CHEMIST TO B.D.F.A.

	Milk from Mr. Lousley		Milk from University College Farm	
	Morn.	Even.	Morn.	Even.
May				
11.....	3.66	4.66	4.15	4.32
12.....	—	4.68	—	4.23
13.....	3.36	—	3.78	—
17.....	—	—	3.66	4.49
18.....	3.55	3.99	—	—
20.....	3.00	—	3.83	—
24.....	—	3.67	—	4.65
25.....	3.52	—	3.69	—
26.....	—	4.66	—	4.90
27.....	3.51	—	3.64	—
31.....	—	4.65	—	4.38
June				
1.....	3.82	—	3.59	—
Averages.....	3.49	4.38	3.76	4.49

THE DAIRY SHOW OF 1908.

By W. ASHCROFT, 13, The Waldrons, Croydon.

The newest feature in this year's Show was due to the enlarged Gilbey Hall being at the disposal of the Committee.

This enabled them for the first time to place the whole of the cheese and butter exhibits, together with the honey, bacon and hams, roots, etc., in one spacious building entirely by themselves. Old frequenters no doubt missed the rows of cheeses they had become accustomed to between the working dairy and the clock, but the gain in space was greatly to the benefit of the Show, and exhibitors of cheese must surely rejoice that their exhibits are transferred from the heated atmosphere of the large Hall to a much cooler and better ventilated building, and visitors also that they can now inspect and walk from one section of dairy produce to another with ease and comfort.

A comparison with the entries in previous Shows, as set forth in the following table, makes the total number of exhibits the largest on record. A small increase of entries in many classes largely accounts for this, and perhaps the only conspicuous falling-off was in the smaller competition in the classes of *ton Cheddars* :—

	1903.	1904.	1905.	1906.	1907.	1908.
Cattle	203	164	182	240	237	247
Milking and Butter Tests.. ..	186	167	217	247	245	224
Goats	30	46	51	51	48	72
Poultry	2,860	2,678	3,068	3,347	3,081	3,280
Pigeons	2,485	2,426	2,440	2,573	2,664	2,564
Poultry and Pigeon Appliances	—	—	—	55	65	50
British Cheese	269	250	268	255	420	357
Bacon and Hams	79	46	49	39	57	76
Butter	555	556	641	578	593	668
Cream	59	44	52	42	35	47
Skin-Milk Bread, &c.	83	140	121	159	118	135
Honey, &c... .. .	125	122	124	118	67	85
Egg and Butter Packages	17	20	—	—	—	—
New and Improved Inventions	24	43	22	17	33	37
Vehicles for Conveying Milk ..	27	25	—	—	—	—
Roots	144	184	170	156	177	181
Butter-Making Contests	150	172	206	199	200	207
Milkers' Contests	36	55	66	121	135	132
	7,332	7,138	7,677	8,197	8,175	8,362

Cattle.

The Cattle Classes on the whole must be considered quite equal in quality to those seen at previous Dairy Shows; the class for Pedigree Shorthorns, however, made a distinct advance, and must

be specially noted as forming the best collection of pedigree dairy Shorthorn cows hitherto seen at the Agricultural Hall; the judge remarks that "he never saw such a strong class showing such good dairy properties." The honours gained by the first prize cow in Class 1 in the milking trials speak for themselves; never before has a Pedigree Shorthorn literally swept the board, and carried off all the leading distinctions.

The Non-Pedigree Shorthorns were also a good class, the judge commending particularly the first and second prize animals.

The bulls were a useful class, judged from a dairy point of view.

Lincolnshire Red Shorthorn cows were considered by the judge an excellent milking class, with a very good cow in the winner.

Class 4, Pedigree Shorthorn heifers, received generally marked commendation from the judge; but Class 5, with the exception of the winner, he considered weak.

The Jersey cows, Class 6, were a "very good lot of dairy cattle, headed by a typical cow of the breed; only one cow failed to obtain honours."

Class 7, English-bred Jersey heifers, was "not considered a strong class, as, with the exception of the first prize animal, the usual symmetry peculiar to the Jersey was absent."

Class 8, Jersey heifers bred in the Channel Islands, "had fine specimens of island cattle in the prize winners and those obtaining commended cards, but was marred by a number of heifers obviously sent for sale."

Class 20, Jersey bulls. "The older bulls in this class were good, but with one or two exceptions the younger animals were not up to the usual standard."

Class 9, Guernseys, was a fair class of aged cows. The first prize was "rich in quality, with a very good silky bag, and a good type of Guernsey." The second prize "had a good udder, but a plain head, and was somewhat fleshy behind."

Class 10, Guernsey heifers, 4 in number, was good enough to warrant the recommendation of a second prize.

The Red Polled cows, Class 10, was considered "throughout of very great merit, every animal calling for notice, and showing a great improvement in the type of animal" which had come before the same judge at the Dairy Show 4 years ago.

The heifers, though short in number, were also considered a very good class, and a second prize was recommended.

Ayrshire cows were a moderate class.

Kerries and Dexters were fairly represented, both in number and quality.

Class 17, Pairs of Cows, was a strong class, with very close competition for first prize honours.

Class 18. In the Single Cow Class the first prize was considered by the judge "an easy winner, though the whole class was good."

Cheese.

The judges of Cheddar cheese report that some of the exhibits in the class for 20 cheeses "were rough on the outside and badly finished; a few of the lots were badly flavoured, and a good many rather disappointing, although they had a good appearance they were off flavour." The same criticism applied to the fours, and they considered that even the first prize cheeses in both the above classes "lacked the nutty flavour more prominent in Cheddars 15 or 20 years ago than it is now."

In the Truckles, not considered a good show, "there was room for great improvement; being a family cheese, they should be made more attractive in appearance."

In the Cheshire classes the number of entries was large, but the "general quality of the exhibits was considered far from satisfactory." The judge attributes a good deal of this poor condition to the excessive heat during the time of conveyance to London and the ill-ventilated railway vans in vogue on English railways, contrasting unfavourably with those provided on the Continent for food stuffs in hot weather; "the majority of the Cheshire exhibits were moreover quite unfit for the London market, being a thorough Yorkshire curd (very new), and not of the finest; many exhibits were disqualified on account of mottled colour."

The white cheese in this section were considered the best, though the judge in his experience finds white Cheshire cheese rather unsaleable in London.

The Lancashire class was spoken of in rather more favourable terms by the same judges, the quality all round pronounced fairly good, and the first prize rich and fine in flavour.

Double Gloucesters the judge considered the best he had judged for some years, and the singles about up to the average.

The exhibits of Derby cheese "ought to be better," and the judge reports several as only "imitation Cheddar in Derby shape."

Caerphilly cheese was a "fairly good class, though some of the exhibits did not possess the characteristics of a true Caerphilly."

Cream cheeses were varied and unequal in character, with two very good exhibits placed equal first, and two good cheeses placed equal second..

In a class of 8 entries of Gervais, the judge considered only two fairly good.

In unripened soft cheese, of 14 entries the same criticism applied, and only two exhibits approved in the class for ripened soft cheese.

Cream.

Clotted and cream other than clotted were considered splendid classes.

Butter.

Of the very large classes of roll butters (56 to 61) the judges, as usual, comment very favourably, describing many of the exhibits as excellent, though it is pointed out that in Classes 56 to 58 (free from salt) there was often a lack of good "butter flavour," probably due to over-washing, and that quite a dozen lots were very slightly salted, and consequently disqualified.

Of the cured butters (63 to 65), mostly from Ireland, the general quality was reported good, though in some cases the packing "left much to be desired." The Colonial butter classes were large and well filled. The ornamental butter classes "were perhaps some of the best yet seen at the Dairy Show."

Bacon and hams were considered of unequal merit, the judge regarding the bacon classes as "a very poor exhibit, in many cases wanting in quality," while the display of hams "was good, and did credit to the Show."

Honey.

The Honey Section formed an attractive feature of the display of produce in the Gilbey Hall. The number of entries showed a slight increase on those of 1907, but the difference in quality was considerable. Excellent samples were staged in the classes for light, medium-coloured, and dark honey, the latter including heather mixture, and the same may be said of the granulated honey, Class 81. The class for Heather Honey in sections still lacks support, only five entries being staged, and in consequence only one prize awarded. In the class for Display of Comb and Extracted Honey five very attractive trophies were staged, and made a uniformly good show, which we considered as warranting us in recommending the Council to allow a second prize to No. 1661. The remaining classes were good, but call for no special remark, with the exception of Class 87 for "Interesting Exhibits of a Scientific or Practical Nature." The exhibit numbered 1681, which secured the prize, was an exceptionally good one, consisting of numerous samples of pollen from the best bee-forage plants, gathered direct from the flowers by the exhibitor himself, and shown in phials preserved in solution, several books containing scores of original drawings (greatly enlarged) showing the shapes of the various pollen grains, and also a large collection of slides mounted for the microscope for use of lecturers. This exhibit was of the greatest

interest to bee-keepers, as enabling them by testing to tell the source from which honey comes.

Skim-milk Bread and Scones.

All classes in this section were highly praised by the judge.

Class 72, white bread, 39 exhibits ; " an excellent class throughout for quality, the first prize, brick shaped, good in shape and texture, and perfectly baked, closely pressed for second honours by an almost equally good exhibit cottage shape."

Brown bread, 40 exhibits, " also very good in quality, and an improvement on previous years."

Fancy bread was considered well up to the average.

The first prize in home-made bread the judge estimated as the best he had ever seen in an amateur class.

Scones " were excellent in quality, and the competition very keen."

Class 48, for collection of British Dairy Produce, brought forward only one competitor, Messrs. Applin & Barratt, to whom was awarded a Gold Medal.

The British Dairy Institute furnished, as usual, a good collection of the various cheeses made during the season by the students, as well as exhibits illustrating dairy education from a scientific point of view. In the unavoidable absence of Mr. Miles Benson through illness, the stand was arranged and superintended by Mr. John Benson, ably assisted by several students from the Institute who had just gained their diploma. An interesting feature of the Show in connection with the Institute was the presentation of a testimonial to " Jim," who has worked in the dairy and helped many students ever since the Institute's early days at Aylesbury.

Roots.

Roots, taken as a whole, were a good collection, though the practice of growing abnormally large bulbs by the excessive use of nitrates does not conduce to quality, especially in the mangold classes, many of the bulbs opening hollow and soft ; some good exhibits unfortunately arrived too late for competition.

The first prize in the collection of roots for cattle feeding in winter were all good specimens, very well shown.

Butter-making Contests.

The butter-making contests evoked the usual interest both in competitors and spectators. We are glad to see one of the judges (Miss Louise Mathews) lays her finger on what we consider one of the weak points of these competitions, viz., the excessive churning in water in order to secure a good round grain. She very pertinently

says in her report : " Churning for grain is carried too far in some cases, and I feel sure the butter is not improved by this over churning in water in order to secure a round grain, either in colour or flavour."

Milkers' Contests.

All the various classes of milkers received highly commendatory remarks from the judges, both as regards cleanliness, speed, good stripping, and keen competition.

Inventions.

In a class numbering 14, for Railway Churns, the gold medal was won by No. 1870, " an exceedingly good churn, well made, with two lids and sufficient ventilation." The silver medal went to No. 1865, " a churn strong in construction, very well made to protect abuse, and easily fastened to prevent fraud." No. 1868 was awarded a bronze medal.

In Class 95, for New Inventions, the judges make the following comments and awards :—

No. 1880—Cream Separator, new model, " Alfa Laval " A 11, shown by Dairy Supply Co. " This is an excellent separator—well worthy of a silver medal."

No. 1887—Cream Separator, for hand power, " Primus " C, shown by Moeller & Condrup. " A very good separator, easily managed, while in work and easily cleaned ; very moderate in price (£6 16s.) ; also awarded a silver medal."

No. 1896—Milk Cooling Cylinder, " Astra," shown by Berge-dorfer Eisenwerk Aktiengesellschaft. " A novel milk cooler of very great service, awarded a silver medal."

No. 1891—Patent Side Delivery Rake, shown by Martin's Cultivator Co. " An excellent hay collector, useful for several purposes, saving much labour ; was awarded a silver medal."

Bronze medals were awarded to :—

No. 1883—Separator and Milk Cleaner, shown by Burmeister and Wain.

No. 1892—Condensed Milk Tins, shown by Wilts United Dairies.

No. 1894—Cheese Vat, shown by Pond & Sons.

No. 1895—Milk Refrigerator, shown by Thomas Grayson.

No. 1898—Dr. Gerber's Tester for Dirt in Milk, shown by Dairy Supply Co.

THE MILKING TRIALS OF 1908.

By S. R. WHITLEY, Little Westlands, Lingfield, Surrey.

The Milking Trials were carried out on similar lines to previous years. The number of entries was again large, 108 animals (excluding goats) being actually tested, practically the same number as in 1907 and 1906.

The data on which the awards were calculated are as follows, viz. :—

- (1) One point for every pound of milk, taking the average of two days' yield.
- (2) Twenty points for every pound of butter-fat produced, as calculated from analysis.
- (3) Four points for every pound of solids other than fat, similarly calculated.
- (4) A bonus of one point for every 10 days since calving, after the first 40 days, the maximum allowance being 12.

Deductions were made of 10 points for each time the milk fell below the legal standard of 3 per cent. of fat, or below 8·5 per cent. of solids other than fat.

It will be noticed that the above data correspond exactly with those of last year, and it cannot be too often urged that a large part of the value of these Trials depends on their being carried out on similar lines from year to year if they are to maintain and increase their value as authentic records of what is possible in each of the breeds, and so to form a basis of comparison from year to year and breed to breed. Every change of detail is much to be deprecated, and should not lightly be entered upon.

The cows were milked in the presence of the stewards on Tuesday evening at 6 p.m. On the Wednesday the milking began at 6·30 a.m., and the milk yielded by each cow was weighed and sampled for analysis. Milking in the evening began at 6 p.m.,

when the milk was again weighed and sampled. On Thursday the milk was weighed both morning and evening, in order to obtain the average weight of milk on two days' milking, and the points calculated according to the above stated data.

During the year the Council again had under revision the various standards for each breed, below which no prize is to be awarded, with the result that the standard for Pedigree Shorthorn cows was raised to 90, it having been lowered in 1905 to 85. The standard for Lincoln Red Shorthorns was lowered from 110 to 100. The standards for other breeds were maintained as last year, and are set out in Table I. on page 3. The Council also decided to postpone the fixing of standards for the various Heifer classes until they have further figures relating to these classes.

Three vital questions arise in connection with these Trials, viz. :—

- (1) What proportion of the animals tested gain points up to the standard fixed for each breed ?
- (2) How many animals in each class give milk deficient in fat and solids other than fat as judged by the legal standard of quality ?
- (3) Do the figures obtained point to an improvement in milking qualities or to the reverse ?

These three questions are fully answered by the following four tables :—

TABLE I.—SHOWING THE NUMBER OF COWS COMING UP TO THE STANDARD.

BREED	Standard			In 1908		In 1907		In 1906		In 1905		In 1904		In 1903	
	In 1908	In 1906 and 1907	From 1903 to 1905	In 1908		In 1907		In 1906		In 1905		In 1904		In 1903	
				Cows Tested	Above Standard of 1908	Cows Tested	Above Standard of 1907	Cows Tested	Above Standard of 1906	Cows Tested	Above Standard of 1905	Cows Tested	Above Standard of 1904	Cows Tested	Above Standard of 1903
horthorns, Pedigree	90	85	90	15	10	17	12	11	5	8	3	6	1	7	4
horthorns, Non-Pedigree	110	110	120	19	10	22	8	15	5	14	6	16	5	16	10
lincoln Red Short-horns	100	110	—	9	2	7	2	—	—	—	—	—	—	—	—
arneys	95	95	95	16	5	12	3	13	3	13	7	14	6	18	7
uernseys	85	85	90	5	2	5	3	6	3	5	1	7	1	6	—
ed Polls	90	90	90	9	1	8	4	11	1	13	3	7	3	7	1
yrshires	90	90	100	6	—	3	—	3	1	3	—	1	—	—	—
erries	75	75	75	6	2	5	4	5	3	8	3	7	5	4	—
exters	75	75	75	6	1	8	2	3	—	—	—	3	1	—	—
nuth Devons.. ..	—	100	—	—	—	—	—	5	3	—	—	—	—	—	—
TOTAL.. ..				91	33	87	38	72	24	64	23	61	22	58	22

TABLE II.—NUMBER OF COWS (NOT INCLUDING HEIFERS)
YIELDING MILK DEFICIENT IN FAT OR SOLIDS OTHER
THAN FAT.

BREED	Less than 3 per cent. of Fat			Less than 8·5 per cent. of Solids not Fat		
	1906	1907	1908	1906	1907	1908
Shorthorns, Pedigree ...	4	8	4	1	2	2
Do. Non-Pedigree	4	8	4	3	0	4
Lincoln Red Shorthorns...	0	3	4	0	0	1
Jerseys	0	0	1	0	0	0
Guernseys	0	0	0	0	0	1
Red Polls	3	1	2	0	0	1
Ayrshires	1	2	5	0	1	4
Kerries	0	0	0	0	0	1
Dexters	1	0	2	0	1	0
Crosses	5	0	0	0	0	0
South Devons	1	0	0	0	0	0

TABLE III.—QUANTITY AND QUALITY OF MILK.

Breed	Period	Number of Cows	Weight of Milk	COMPOSITION OF MILK		
				Fat	Solids other than Fat	Total Solids
Shorthorns, Pedigree } and Non-Pedigree }	In 5 Years 1900-1904	123	48.8	3.72	8.89	12.61
Shorthorns, Pedigree...	1905	8	46.3	3.40	9.07	12.47
" " ...	1906	11	46.7	3.36	8.93	12.29
" " ...	1907	17	47.9	3.56	8.95	12.51
" " ...	1908	15	48.3	3.57	9.01	12.58
Shorthorns, Non- } Pedigree }	1905	14	50.8	4.12	8.97	13.09
" " ...	1906	15	47.3	3.58	8.77	12.35
" " ...	1907	22	50.8	3.54	8.92	12.46
" " ...	1908	19	51.3	3.88	8.88	12.71
Lincolnshire Red } Shorthorns }	1907	7	51.8	3.41	8.95	12.36
" " ...	1908	9	48.7	3.58	8.77	12.35
Jerseys	1900-1904	111	31.3	5.20	9.20	14.40
"	1905	13	34.7	5.25	9.14	14.39
"	1906	13	33.1	4.75	9.33	14.08
"	1907	12	34.9	5.10	9.17	14.27
"	1908	16	34.2	4.49	9.16	13.65
Guernseys	1900-1904	36	31.5	4.58	9.07	13.65
"	1905	5	31.4	4.81	9.15	13.96
"	1906	6	34.5	4.42	9.29	13.71
"	1907	5	35.7	4.59	9.34	13.93
"	1908	5	33.6	4.68	8.92	13.60
Red Polls	1900-1904	33	40.5	3.70	9.00	12.70
"	1905	13	38.5	3.63	8.93	12.56
"	1906	11	37.4	3.35	9.02	12.37
"	1907	8	41.5	3.62	8.87	12.49
"	1908	9	36.5	3.50	9.09	12.59
Ayrshires	1906	3	42.5	3.56	9.02	12.58
"	1907	3	33.5	3.22	8.85	12.07
"	1908	6	39.8	3.13	8.67	11.80
South Devons	1906	5	48.3	3.72	9.21	12.93
"	1908	...	...	...	...	...
Kerries	1900-1904	43	30.9	4.12	9.14	13.26
"	1905	8	33.2	4.10	8.96	13.06
"	1906	5	36.0	4.25	9.22	13.47
"	1907	5	40.3	4.3	8.98	13.28
"	1908	6	34.8	3.74	8.96	12.70
Dexters	1906	3	24.4	3.38	8.90	12.28
"	1907	8	31.0	3.66	9.06	12.72
"	1908	6	31.3	3.82	8.93	12.75
Crosses	1900-1904	50	45.1	3.92	8.94	12.86
"	1905	12	45.7	3.82	9.08	12.90
"	1906	13	46.4	3.54	9.14	12.68
"	1908	...	...	...	...	...

TABLE IV.—QUANTITY AND QUALITY OF MILK, 1906, 1907, AND 1908.

BREED	Year	No. of Cows	Average Weight of Milk		Percentage Composition of Milk					
			Morn.	Even.	Fat		Solids not Fat		Total Solids	
					Morn.	Even.	Morn.	Even.	Morn.	Even.
Shorthorns, Pedigree..	1905	11	23.9	22.8	3.26	3.46	8.91	8.95	12.17	12.41
	1907	17	24.2	23.7	3.14	3.08	9.02	8.88	12.16	12.86
	1908	15	21.2	21.0	3.26	3.88	9.18	8.84	12.44	12.72
	1906	3	14.8	13.9	3.61	4.10	9.46	9.11	13.21	13.21
Do. do. (Heifers)	1906	7	11.7	11.4	3.7	3.60	9.16	9.11	12.86	12.97
	1907	9	16.1	16.6	3.70	3.36	9.20	8.95	11.90	12.81
	1908	15	23.7	23.6	3.34	3.82	8.83	8.72	12.17	12.54
	1907	22	25.8	25.0	3.37	3.72	8.45	8.9	12.32	12.62
Shorthorns, Non-Pedigree ..	1907	10	26.3	24.9	3.66	4.00	9.01	8.73	12.76	12.73
	1908	7	16.0	15.3	3.41	3.95	9.10	9.05	12.51	13.00
	1907	8	18.8	17.7	3.28	3.54	9.24	9.24	12.52	12.78
	1908	7	17.8	16.9	3.80	3.74	9.20	9.12	13.09	12.86
Do. do. (Heifers)	1907	7	27.1	27.7	3.28	3.55	8.95	8.95	12.23	12.50
	1908	6	24.8	23.0	3.24	3.93	8.84	8.70	13.03	12.63
	1907	13	17.1	16.9	4.69	4.81	9.34	9.32	14.08	14.73
	1908	10	17.4	16.8	4.57	4.91	9.25	9.09	13.76	14.77
Lincolnshire Red Shorthorns	1907	12	17.4	16.9	4.07	4.51	9.33	9.26	13.64	13.77
	1908	6	17.9	18.6	4.38	4.60	9.30	9.30	13.64	13.90
	1907	5	17.5	16.1	4.35	4.88	9.08	8.76	13.57	13.64
	1908	11	18.9	18.5	4.49	4.80	9.15	8.89	12.55	12.49
Do. (Heifers)	1907	8	21.9	19.6	3.40	3.60	8.84	8.91	12.42	12.38
	1908	9	18.6	17.9	3.58	3.67	9.20	8.98	12.61	12.51
	1906	8	14.5	13.2	3.44	3.22	9.22	9.22	12.11	12.44
	1907	8	11.26	13.55	2.79	3.27	9.11	9.07	12.90	12.50
Ayrshires ..	1907	4	14.6	13.8	3.76	3.57	9.25	9.16	12.78	12.73
	1908	3	22.2	20.3	3.53	3.91	9.01	9.03	12.58	12.50
	1906	3	16.9	16.6	3.57	3.40	8.81	8.81	12.95	12.63
	1907	3	16.9	16.6	3.16	3.52	8.83	8.83	12.95	12.63
South Devons ..	1907	6	20.2	19.6	2.71	3.52	8.82	8.82	12.58	12.63
	1908	6	25.1	23.2	2.71	3.52	8.82	8.82	12.58	12.63
	1906	5	25.1	23.2	3.44	4.01	9.27	9.15	12.71	13.10
	1907	5	18.8	17.7	4.17	4.34	9.07	9.23	13.37	13.57
Kerries ..	1907	5	20.5	19.8	3.88	4.73	9.07	8.89	13.35	13.52
	1908	6	19.0	16.8	3.81	3.68	9.69	8.84	12.90	12.50
	1906	3	12.3	12.1	3.29	3.45	9.16	8.65	12.45	12.45
	1907	8	16.1	14.9	3.69	3.63	9.08	9.05	12.71	12.98
Dexters ..	1908	6	16.1	14.3	3.66	3.68	9.05	8.82	12.71	12.80
	1906	13	23.5	22.9	3.39	3.69	9.19	9.10	12.58	12.79
	1907	6	11.8	11.7	3.18	3.03	9.20	9.08	12.38	13.01
	1908	6	11.8	11.7	3.18	3.03	9.20	9.08	12.38	13.01

Table No. I. shows the number of animals in each class coming up to the standard fixed for each breed, with corresponding figures for four previous years.

Table No. II. shows the number of cows yielding milk deficient in fat or solids other than fat, with the corresponding figures for two previous years.

Tables Nos. III. and IV. show the average quantity and quality of the milk yielded by each class.

Taking the breeds class by class, we find that in Class 1., for Pedigree Shorthorn cows, the improvement shown in 1907 is well maintained; about 66 per cent. came up to the higher standard of 90 points, 4 out of 15 gave milk deficient in fat, and 2 out of 15 gave milk deficient in solids other than fat.

The average quantity and quality of milk in this class is slightly better than in the three previous years.

CLASS 1.—While this class is distinctly good, and leads one to think that scientific breeding by pedigree for milk is slowly telling its tale, the outstanding feature is undoubtedly Lord Rothschild's cow "Dorothy," which creates a new record by gaining "a double first," and thereby winning The Spencer Challenge Cup, The Barham Challenge Cup, The Lord Mayor's Cup for Shorthorns, and the Shorthorn Society's prize of £10—truly a wonderful record!

CLASS 2 (Non-Pedigree Shorthorns), with 19 entries, does not come out quite so well. About 53 per cent. reach the standard of 110, while 4 out of 19 gave milk deficient in fat, and 4 out of 19 gave milk deficient in solids other than fat.

The average quantity and quality of milk in this class is also slightly better than in the three previous years, though no animal reaches the wonderful scores of the first, second, and third prize winners of 1907.

CLASS 3 (Lincoln Red Shorthorns), with nine entries, does not differ very materially from last year, though only 22 per cent. reach the reduced standard of 100, while 4 out of 9 gave milk deficient in fat, and 1 out of 9 gave milk deficient in solids other than fat.

The average quantity is slightly less than in 1907, while the quality is much the same.

CLASS 6 (Jerseys), with 16 entries, of which only 31 per cent. reached the standard of 95. While the average quantity of milk is similar to previous years, the percentage of fat is considerably lower, and one wonders if the exceptionally heated state of the atmosphere during the Show has really accounted for this apparent falling off—the average number of points gained is only 82.34, as against 86.9 last year.

CLASS 9 (Guernseys), 3 entries, of which 2 reach the standard of 90, while 1 yields milk deficient in solids other than fat, though the average is not strikingly different from previous years.

CLASS 11 (Red Polled Cows), with 9 entries, of which only 1 reaches the standard of 90 points, 2 yield milk deficient in fat, and 1 yields milk deficient in solids other than fat.

The average quantity of milk is materially less than last year; the average of butter-fat is less than last year, but better than the previous year. In solids other than fat there has been no great difference during the last three or four years.

CLASS 13 (Ayrshire Cows), with 6 entries. There was no award, as no animal reached the standard of 90; in fact, mainly owing to the many deductions for poor milk, no animal came near attaining to the standard, and one must again express regret that a breed so well known for its milking qualities should be so poorly represented at the Dairy Show. Only one animal in the class escaped deductions for poor milk, and the less said about the class the better, as no conceivable reduction of the breed's standard would have made it possible to award a prize. For charity's sake, we must hope that the heated atmosphere of the hall accounted for the extreme poverty of the milk.

CLASS 15 (Kerries), with 6 entries. There are only 2 attaining the standard of 75 points, but no deductions have to be made for poverty of milk. Last year this breed did remarkably well, and if we exclude those figures, the average quantity of milk is fairly good, but the quality is decidedly poorer than usual.

CLASS 16 (Dexters), with 6 entries. Only 1 attains the standard of 75 points, and 2 suffer deductions for poverty of milk, although the average quantity and quality are up to previous years.

Owing to insufficient entries, the class for South Devons had to be cancelled.

CLASS 4 (Pedigree Shorthorn Heifers not exceeding 3 years), with 9 entries, is chiefly remarkable for the poverty of the milk, no less than 6 suffering deductions of points, and the average quantity of butter-fat is actually below the legal standard. The average quantity of milk is materially better than last year, and we must hope that the bad atmospheric conditions of the hall accounted for the poorness of the milk.

CLASS 5 (Non-pedigree Shorthorn Heifers not exceeding 3 years old), with 4 entries, comes out well in comparison with its sister class of pedigree animals, as in no case was the milk below standard, but the class is too small to draw general conclusions.

CLASS 12 (Red Polled Heifers not exceeding 3 years), with 4 entries, only 1 gives milk slightly deficient in fat, and the average quantity and quality is maintained.

A word on the proposed standards for heifers of the various breeds may not be out of place here.

It has been suggested that the standard for heifers should be two-thirds of the present standards for cows of the same breed.

The following table shows how this would have worked out since 1906, when the heifers' classes were instituted :—

TABLE V.

BREED	Total Number Entered		Number above Standard, roughly $\frac{2}{3}$ of Cows	Number above Standard if Standard were 5 points below $\frac{2}{3}$ Cows	Average Number of Pounds gained
Shorthorn, Pedigree (Heifers)...	1906	3	2	2	60.6
	1907	7	Nil	Nil	47.3
	1908	9	4	4	54.8
	Standard for Cows = 90 $\frac{2}{3}$ = say 60				
Shorthorns, Non-Pedigree (Heifers)	1906	7	1	2	64.4
	1907	8	3	6	70.8
	1908	4	2	2	72.8
	Standard for Cows = 110 $\frac{2}{3}$ = say 75				
Red Polled (Heifers)	1906	9	1	3	50.0
	1907	8	4	5	55.3
	1908	4	2	3	58.5
	Standard for Cows = 90 $\frac{2}{3}$ = say 60				

It will be seen that such a standard would have cut off entirely the Pedigree Shorthorn Heifers in 1907 from obtaining a prize, but if the standard had been 5 points lower they would still have been debarred.

As the purpose of fixing a standard is mainly to prevent an animal inferior in milking qualities from gaining a prize, perhaps it would be well to fix the standards for heifers low enough to start with, say 5 points below two-thirds of the cows' standards.

CLASS 1.—PEDIGREE SHORTHORN COWS.

Number Name ..	2 Babraham Darling Lady 6 yr. 7 m. 6 dys. 4 May 14. 146	3 Darlington Cranford 11th 6 yr. 5 m. 1 w. 4 July 11. 88	4 Everly Beauty 8 yr. 2 w. — Aug. 7. 61	5 Everly Red Rose 2nd 4 yr. 7 m. 1 w. — Sept. 2. 35
Age ..	..	..	..	..
Number of Calves ..	..	..	..	..
Last Calved ..	..	..	..	..
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	18-0 17-5	22-9 29-7	29-4 29-1	19-3 18-7
Total ..	18-1 17-7	26-4 25-4	31-5 29-8	20-6 21-3
Average ..	36-1 35-2	49-3 55-1	60-9 58-9	39-9 40-0
Percentage { Fat ..	18-0 17-6	24-6 27-5	30-4 29-4	19-9 20-0
Composition of { Solids other than Fat ..	3-71 4-31	2-65 3-83	3-06 3-66	2-93 3-32
the Milk. { Solids ..	9-63 9-33	9-47 9-23	8-50 8-40	9-01 8-72
Actual weight of Fat, in lbs. ..	13-34 13-64	12-12 13-06	11-56 12-06	11-94 12-04
Calculation of Points multiply by 20 ..	.67 .76	.65 1-05	.93 1-08	.58 .66
Actual weight of Solids other than Fat, in lbs ..	13-4 15-2	13-0 21-0	18-6 21-6	11-6 13-2
Calculation of Points multiply by 4 ..	1-74 1-64	2-32 2-54	2-58 2-48	1-80 1-74
Points { For time since Calving ..	6-96 6-56	9-28 10-16	10-32 9-92	7-20 6-96
{ For weight of Milk ..	10-6	4-8	2-1	—
{ For weight of Fat ..	35-6	52-1	59-8	39-9
{ For weight of Solids other than Fat ..	28-6	34-0	40-2	24-8
Total ..	13-5	19-4	20-2	14-2
Deductions ..	88-3	110-3	122-3	78-9
Points gained ..	—	10-0	10-0	10-0
Remarks and Awards ..	88-3	100-3	112-3	68-9
		Highly Commended.	Reserve and Highly Commended.	

CLASS 1.—PEDIGREE SHORTHORN COWS—Continued.

Number Name ..	..	..	..	6 Appleton Belle	7 Darlington Cranford 5th	8 Dorothy	10 Primrose 2nd
Age	..	..	..	5 yr. 7 m. 2 w.	10 yr. 11 m. 1 w.	7 yr. 5 m. 1 w.	5 yr. 11 m. 2 w.
Number of Calves	..	..	..	—	7	5	3
Last Calved ..	..	..	..	Sept. 8.	April 9.	Aug. 15	July 15.
Days since Calving ..	..	..	..	29	181	53	84
Weight of Milk, 1st day	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	..	..	..	15.4 14.3	27.4 27.6	34.7 31.0	22.8 20.7
Total	..	..	..	15.6 14.3	28.8 27.8	34.0 33.0	23.2 24.6
Average ..	..	..	..	31.0 28.6	56.2 55.4	68.7 64.0	46.0 45.3
Percentage	..	..	..	15.5 14.3	28.1 27.7	34.3 32.0	23.0 22.6
Composition of	..	..	..	3.07 3.50	3.54 3.72	3.20 4.06	3.48 4.48
the Milk. { Solids other than Fat ..	..	..	..	9.15 8.94	8.84 8.74	9.00 8.78	9.08 8.84
Actual weight of Fat, in lbs. { Solids ..	..	..	..	12.22 12.44	12.38 12.46	12.20 12.84	12.56 13.32
Calculation of Points multiply by 20	..	..	..	.48 .50	1.0 1.03	1.10 1.30	.80 1.02
Actual weight of Solids other than Fat, in lbs	..	..	..	9.6 10.0	20.0 20.6	22.0 26.0	16.0 20.4
Calculation of Points multiply by 4	..	..	..	1.42 1.28	2.48 2.42	3.1 2.8	2.09 2.00
Points { For time since Calving ..	..	..	..	5.68 5.12	9.92 9.68	12.4 11.2	8.36 8.00
Points { For weight of Milk ..	..	..	..	—	12.0	1.3	4.4
Points { For weight of Fat ..	..	..	..	29.8	55.8	66.3	45.6
Points { For weight of Solids other than Fat ..	..	..	..	19.6	40.6	48.0	36.4
Total ..	..	..	..	10.8	19.6	23.6	16.4
Deductions ..	..	..	..	60.2	128.0	139.2	102.8
Points gained	..	..	..	—	—	—	—
Remarks and Awards	..	..	..	60.2	128.0	139.2	102.8
	..	..	..	2nd Prize	2nd Prize	1st Prize: Barham C. Cup;	Highly
	..	..	..	Reserve for Short-	Reserve for Short-	Lord Mayor's Cup; £10 Prize	Commended
	..	..	..	horn Society's Prize	horn Society's Prize	for Short-horn Cows, with 227th	

CLASS 1.—PEDIGREE SHORTHORN COWS—Continued.

Number Name ..	..	..	..	11 Red Rose 3rd	12 Waterloo Cranford 22nd	13 Primula 70th	14 Decentia 34th
Age ..	..	..	..	7 yr. 11 m. 1 w. 5	3 yr. 10 m. 2 w. Aug. 30. 38	8 yr. 8 m. 3 w. April 1. 189	5 yr. 11 m. Sept. 19. 18
Number of Calves ..	..	..	..	5	..	..	..
Last Calved ..	..	..	..	July 2. 97	..	..	..
Days since Calving ..	..	..	..	..	..	..	..
Weight of Milk, 1st day ..	..	..	..	Morn. Even. 27.7 27.5	Morn. Even. 16.9 18.2	Morn. Even. 24.0 22.2	Morn. Even. 27.7 30.2
Weight of Milk, 2nd day ..	..	..	..	29.9 25.4	19.0 16.6	24.4 20.9	28.0 28.8
Total ..	..	..	..	57.6 52.9	35.9 34.8	48.4 43.1	56.6 59.0
Average ..	..	..	..	28.8 26.4	17.9 17.4	24.2 21.5	28.3 29.5
Percentage { Fat ..	..	..	..	2.85 3.36	3.28 5.04	3.32 3.97	3.38 4.11
Composition of { Solids other than Fat ..	..	..	..	9.11 8.86	9.24 8.62	8.82 8.81	9.30 9.57
the Milk. { Solids ..	..	..	..	11.96 12.22	12.52 13.66	12.14 12.78	12.88 13.68
Actual weight of Fat, in lbs. ..	..	..	..	.82 .89	.59 .88	.80 .85	1.03 1.21
Calculation of Points multiply by 20 ..	..	..	..	16.4 17.8	11.8 17.6	16.0 17.0	20.6 24.2
Actual weight of Solids other than Fat, in lbs ..	..	..	..	2.62 2.34	1.65 1.50	2.14 1.90	2.65 2.82
Calculation of Points multiply by 4 ..	..	..	..	10.48 9.36	6.60 6.00	8.56 7.60	10.60 11.28
Points { For time since Calving ..	..	..	..	5.7	..	12.0	..
{ For weight of Milk ..	..	..	..	55.2	35.3	45.7	57.8
{ For weight of Fat ..	..	..	..	34.2	29.4	33.0	44.8
{ For weight of Solids other than Fat ..	..	..	..	19.8	12.6	16.2	21.9
Total ..	..	..	..	114.9	77.3	106.9	124.5
Deductions ..	..	..	..	10.0	..	..	..
Points gained ..	..	..	..	104.9	77.3	106.9	124.5
Remarks and Awards ..	..	..	..	Highly Commended.	..	Highly Commended.	3rd Prize

CLASS 1.—PEDIGREE SHORTHORN COWS—Continued.

Number Name ..	..	..	..	15 Ursulina 34th 5	16 Purichlow Cyan 5	18 Waterloo Lady Ada 6
Age ..	..	..	..	6 yr. 9 m. 3 w.	8 yr. 5 m. 2 w.	9 yr. 1 m. 3 w.
Number of Calves ..	..	..	..	5	5	6
Last Calved ..	..	..	..	Aug. 30.	Sept. 5.	Sept. 13.
Days since Calving ..	..	..	..	38	32	24
Weight of Milk, 1st day ..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	..	..	..	19.3 23.2	23.1 25.1	25.1 25.9
Total ..	..	..	..	23.7 23.2	24.3 25.1	26.2 26.3
Average ..	..	..	..	43.0 46.4	47.4 50.2	51.3 52.2
Percentage	..	..	..	21.5 23.2	23.7 25.1	25.6 26.1
Composition of { Fat	..	..	..	3.09 2.94	3.51 3.56	3.64 4.34
the Milk. { Solids other than Fat ..	..	..	..	8.83 8.46	8.51 8.52	9.24 8.86
Actual weight of Fat, in lbs. ..	..	..	..	11.92 11.40	12.02 12.08	12.88 13.20
Calculation of Points multiply by 20 ..	..	..	..	.66 .68	.83 .90	.93 1.13
Actual weight of Solids other than Fat, in lbs	..	..	..	13.2 13.6	16.6 18.0	18.6 22.6
Calculation of Points multiply by 4 ..	..	..	..	1.9 1.96	2.02 2.14	2.36 2.32
Points { For time since Calving ..	..	..	..	7.6 7.84	8.08 8.56	9.44 9.28
{ For weight of Milk ..	..	..	..	44.7	48.8	51.7
{ For weight of Fat ..	..	..	..	26.8	34.6	41.2
{ For weight of Solids other than Fat ..	..	..	..	15.4	16.6	18.7
Total ..	..	..	..	86.9	100.0	111.6
Deductions ..	..	..	..	20.0	—	—
Points gained	..	..	..	66.9	100.0	111.6
Remarks and Awards ..	..	..	..	Highly Commended.	Highly Commended.	Highly Commended.

CLASS 2.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1).

Number Name ..	19 Millie	20 Martha	21 Malsie	23 Mollie
Age ..	About 6 yr.	About 8 yr.	About 6 yr.	7 yr.
Number of Calves Last Calved ..	June 17. 11-2	July 22. 7-7	Sept. 21. 1-6	Sept. 8. 2-9
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	30-3 28-7	31-2 27-6	30-9 30-8	32-5 32-0
Total ..	20-8 25-8	29-5 25-5	34-0 32-8	36-8 31-9
Average ..	60-1 54-5	60-7 53-1	64-9 63-6	69-3 63-9
Percentage { Fat	30-0 27-2	30-3 26-5	32-4 31-8	34-6 31-9
Composition of { Solids other than Fat	3-13 3-33	3-20 4-01	3-45 3-46	2-07 2-07
the Milk. { Solids ..	8-71 8-35	9-18 8-89	9-55 9-46	8-47 8-31
Actual weight of Fat, in lbs. ..	11-84 11-68	12-38 12-90	13-00 12-92	10-54 10-38
Calculation of Points multiply by 20 ..	-94 -90	-97 1-06	1-12 1-10	-72 -66
Actual weight of Solids other than Fat, in lbs	18-8 18-0	19-4 21-2	22-4 22-0	14-4 13-2
Calculation of Points multiply by 4 ..	2-62 2-28	2-78 2-34	3-1 3-0	2-94 2-65
Points { For time since Calving ..	10-48 9-12	11-12 9-36	12-4 12-0	11-76 10-60
{ For weight of Milk ..	7-2	3-7	—	—
{ For weight of Fat ..	57-2	56-8	64-2	66-5
{ For weight of Solids other than Fat ..	36-8	40-6	44-4	27-6
Total ..	19-60	20-5	24-4	22-4
Deductions ..	120-8	121-6	133-0	116-5
Points gained ..	10-0	—	—	40-0
Remarks and Awards ..	110-8	121-6	133-0	76-5
	Highly Commended.	Reserve and Very Highly Commended.	1st Prize: Reserve to Spencer C. Cup, 2660; Reserve to Barham Cup; Reserve to Lord Mayor's Cup.	

CLASS 2.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1)—Continued.

Number.	29	30	31	32
Name ..	Rose	Dairymaid	Victoria	Laura 4th
Age ..	5 yr. 1 m. 2 w.	4 yr. 10 m.	6 yr.	8 yr. 1 m.
Number of Calves ..	—	—	—	—
Last Calved ..	Sept. 22. 15	Aug. 17. 51	Sept. 15. 22	Sept. 11. 26
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	20.0 20.0	17.5 19.6	23.0 25.4	28.0 28.0
Total ..	20.7 19.5	19.5 16.6	28.1 23.3	28.0 26.6
Average ..	40.7 39.5	37.0 36.2	52.0 48.7	57.0 54.6
Percentage { Fat ..	20.3 19.7	18.5 18.1	26.0 24.3	28.5 27.3
Composition of { Solids other than Fat ..	5.26 4.56	1.57 2.33	3.82 5.04	3.58 4.15
the Milk. { Solids ..	8.94 9.04	9.37 9.19	8.98 8.56	9.26 8.91
Actual weight of Fat, in lbs. ..	14.20 13.60	10.94 11.52	12.80 13.60	12.84 13.06
Calculation of Points multiply by 20 ..	1.07 .92	.29 .42	1.0 1.22	1.02 1.13
Actual weight of Solids other than Fat, in lbs ..	21.4 18.4	5.8 8.4	20.0 24.4	20.4 22.6
Calculation of Points multiply by 4 ..	1.80 1.78	1.74 1.66	2.34 2.04	2.64 2.44
Points { For time since Calving ..	7.20 7.12	6.96 6.64	9.36 8.16	10.56 9.76
{ For weight of Milk ..	—	1.1	—	—
{ For weight of Fat ..	40.0	36.6	50.3	55.8
{ For weight of Solids other than Fat ..	39.8	14.2	44.4	43.0
Total ..	14.3	13.6	17.5	20.3
Deductions ..	94.1	65.5	112.2	119.1
Points gained ..	—	20.0	—	—
Remarks and Awards ..	94.1	45.5	112.2	119.1
			Highly Commended.	Highly Commended.

CLASS 2.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1)—Continued.

Number Name ..	34 Pet	35 Daisy	37 Welcome	38 Sweet
Age ..	5 yr. 10 m.	7 yr. 6 m.	6 yr.	6 yr.
Number of Calves ..	3	4	—	—
Last Calved ..	Sept. 23.	July 28.	Sept. 23.	Sept. 6.
Days since Calving ..	14	71	14	31
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	28.1 26.8	29.2 22.6	22.3 23.4	25.4 27.2
Total ..	28.8 27.4	26.4 24.4	23.5 22.5	26.3 28.2
Average ..	56.9 54.2	55.6 47.0	45.8 45.9	51.7 55.4
Percentage of Fat ..	28.4 27.1	27.8 23.5	22.9 22.9	25.8 27.7
Composition of Solids other than Fat ..	4.39 4.43	5.26 4.51	3.88 4.35	3.14 4.10
the Milk. (Solids ..	9.35 9.15	8.90 8.77	9.24 9.11	9.22 9.06
Actual weight of Fat, in lbs. ..	13.74 13.58	14.16 13.28	13.12 13.46	12.36 13.16
Calculation of Points multiply by 20 ..	1.25 1.20	1.46 1.06	.89 1.0	.81 1.14
Actual weight of Solids other than Fat, in lbs ..	25.0 24.0	29.2 21.2	17.8 20.0	16.2 22.8
Calculation of Points multiply by 4 ..	2.65 2.48	2.48 2.06	2.12 2.10	2.38 2.50
Points { For time since Calving ..	10.60 9.92	9.92 8.24	8.48 8.40	9.52 10.00
For weight of Milk ..	—	3.1	—	—
For weight of Fat ..	55.5	51.3	45.8	53.5
For weight of Solids other than Fat ..	49.0	50.4	37.8	39.0
Total ..	20.5	18.2	16.9	19.5
Deductions ..	125.0	123.0	100.5	112.0
Points gained ..	—	—	—	—
Remarks and Awards ..	2nd Prize.	3rd Prize.	100.5	112.0
				Highly Commended.

CLASS 2.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1)---(Continued.)

Number Name ..	..	..	..	..	39 Minute	40 Lady Preston	45 Daisy	46 Red Rose
Age ..	..	..	..	..	Unknown	Unknown	5 yr. 3 w.	5 yr. 6 m.
Number of Calves ..	..	..	..	..	3 Aug. 24.	3 Sept. 2.	Sept. 11.	Sept. 7.
Last Calved ..	..	..	..	..	44	35	26	30
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day ..	..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	..	..	..	..	35.8 25.1	25.9 22.7	19.4 19.1	29.4 30.0
Total ..	..	..	..	..	28.7 22.5	21.3 24.9	20.6 18.8	30.7 30.4
Average ..	..	..	..	..	64.5 47.6	47.2 47.6	40.0 37.9	60.1 60.4
Percentage (Fat ..	..	..	..	..	32.2 23.8	23.6 23.8	20.0 18.9	30.0 30.2
Composition of { Solids other than Fat ..	..	..	..	..	2.84 4.64	3.99 3.87	4.95 5.65	2.98 3.85
the Milk. { Solids ..	..	..	..	..	8.72 8.62	8.93 8.79	8.43 8.35	8.84 8.43
Actual weight of Fat, in lbs. ..	..	..	..	..	11.56 13.26	12.92 12.66	13.38 14.00	11.82 12.28
Calculation of Points multiply by 20 ..	..	..	..	..	.91 1.10	1.34 .92	.99 1.07	.89 1.16
Actual weight of Solids other than Fat, in lbs	..	..	..	..	18.2 22.0	26.8 18.4	19.8 21.4	17.8 23.2
Calculation of Points multiply by 4 ..	..	..	..	..	2.80 2.06	3.00 2.09	1.69 1.58	2.65 2.55
Points { For time since Calving ..	..	..	..	..	11.20 8.24	12.0 8.36	6.76 6.32	10.60 10.20
{ For weight of Milk ..	..	..	..	..	.4	47.4	38.9	60.2
{ For weight of Fat ..	..	..	..	..	56.0	45.2	41.0	41.0
{ For weight of Solids other than Fat ..	..	..	..	..	40.2	20.4	13.1	20.8
Total ..	..	..	..	..	19.4	113.0	93.2	122.0
Deductions ..	..	..	..	..	116.0	—	20.0	20.0
Points gained	..	..	..	..	10.	113.0	73.2	102.0
Remarks and Awards ..	..	..	..	..	106.0	Highly Commended.		

CLASS 2.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1)—Continued.

Number Name ..	..	..	..	..	47 Ida	48 Queenie	49 Vivolia
Age ..	..	..	..	..	6 yr. 3	5 yr. 6 m. 3	5 yr. 9 m. —
Number of Calves ..	..	..	..	..	Sept. 18. 19	Sept. 17 20	Sept. 14. 23
Last Calved ..	..	..	..	..
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day	..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	21.4 23.9	25.7 25.0	17.1 18.9
Total ..	..	..	..	..	27.0 25.8	27.7 26.2	19.5 19.2
Average ..	..	..	..	..	48.4 49.7	53.4 51.2	36.6 38.1
	..	..	..	..	24.2 24.8	26.7 25.6	18.3 19.0
Percentage of Fat ..	..	..	..	..	3.95 3.83	4.37 4.13	3.81 3.77
Composition of the Milk. { Solids other than Fat ..	..	..	..	..	9.13 8.83	9.09 8.91	9.51 9.11
Actual weight of Fat, in lbs. { Solids ..	..	..	..	..	13.46 12.66	13.46 13.04	13.32 12.88
Calculation of Points multiply by 20 ..	..	..	..	..	.96 .95	1.17 1.06	.70 .73
Actual weight of Solids other than Fat, in lbs	..	..	..	..	19.2 19.0	23.4 21.2	14.0 14.6
Calculation of Points multiply by 4 ..	..	..	..	..	2.2 2.2	2.42 2.28	1.74 1.74
	..	..	..	..	8.8 8.8	9.68 9.12	6.96 6.96
Points { For time since Calving ..	..	..	..	..	—	—	—
For weight of Milk ..	..	..	..	..	49.0	52.3	37.3
For weight of Fat ..	..	..	..	..	38.2	44.6	28.6
For weight of Solids other than Fat ..	..	..	..	..	17.6	18.8	13.9
Total ..	..	..	..	..	104.8	115.7	79.8
Deductions ..	..	..	..	..	—	—	—
Points gained	..	..	..	..	104.8	115.7	79.8
Remarks and Awards ..	..	..	..	..		Highly Commended.	

CLASS 3.—LINCOLNSHIRE RED SHORTHORN COWS.

Number Name ..	50 Burton Spotted 5th	51 Burton Profit 3rd	52 Burton Ruddy 5th	53 Burton Naury 5th
Age ..	5 yr. 6 m. 3 w. 4 Aug. 11. 57	5 yr. 6 m. 2 Aug. 30. 38	6 yr. 11 m. 3 w. 4 July 5. 94	6 yr. 6 m. 4 Sept. 18 19
Number of Calves ..	..	..	..	..
Last Calved ..	..	..	..	..
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	26.5 22.7	20.3 21.0	23.2 22.0	24.6 21.7
Total ..	26.6 23.6	19.7 19.7	25.5 22.7	23.3 23.4
Average ..	53.1 46.3	40.0 40.7	48.7 44.7	47.9 45.1
Percentage ..	26.5 23.1	20.0 20.3	24.3 22.3	23.9 22.5
Composition of ..	3.00 3.02	3.48 5.11	3.30 3.24	5.14 5.26
the Milk. { Solids other than Fat ..	8.75 8.80	9.12 8.69	8.72 8.66	8.46 8.42
Actual weight of Fat, in lbs. ..	11.75 11.82	12.60 13.80	12.02 11.90	13.60 13.68
Calculation of Points multiply by 20 ..	.79 .70	.69 1.04	.80 .72	1.23 1.18
Actual weight of Solids other than Fat, in lbs ..	15.8 14.0	13.8 20.8	16.0 14.4	24.6 23.6
Calculation of Points multiply by 4 ..	2.32 2.04	1.83 1.76	2.12 1.93	2.02 1.90
Points { For time since Calving ..	9.28 8.16	7.32 7.04	8.48 7.72	8.08 7.60
{ For weight of Milk ..	1.7	—	5.4	—
{ For weight of Fat ..	49.6	40.3	46.6	46.4
{ For weight of Solids other than Fat ..	29.8	34.6	30.4	48.2
Total ..	17.4	14.4	16.2	15.7
Deductions ..	98.5	89.3	98.6	110.3
Points gained ..	98.5	89.3	98.6	20.0
Remarks and Awards ..	..	..	..	90.3

CLASS 3.—LINCOLNSHIRE RED SHORTHORN COWS—Continued.

Number Name	..	..	..	..	54	55	56	57
					Burton Nancy 4th	Bracebridge No. 102	Bracebridge Fulleckey	Cadeby Belle
Age	..	..	..	..	8 yr. 3 m.	8 yr. 6 m.	8 yr.	6 yr.
Number of Calves	..	..	..	..	5	5	5	4
Last Calved	..	..	..	..	Sept. 1	Aug. 1.	Aug. 8.	July 13.
Days since Calving	..	..	..	..	36	67	60	86
Weight of Milk, 1st day	..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	29.3 25.3	31.3 32.2	24.3 28.8	25.0 25.4
Total	..	..	..	..	26.8 27.2	33.2 31.9	25.4 22.9	26.0 23.9
Average	..	..	..	..	56.1 52.5	64.5 64.1	49.7 51.7	51.0 49.3
Percentage	..	..	..	..	28.0 26.2	32.2 32.0	24.8 25.8	25.5 24.6
Composition of	..	..	..	..	3.14 3.68	2.87 3.49	2.49 4.22	2.80 3.19
the Milk.	..	..	..	..	8.96 8.84	8.81 8.51	8.83 8.58	8.50 8.53
Actual weight of Fat, in lbs.	..	..	..	..	12.10 12.52	11.68 12.00	11.32 12.80	11.30 11.72
Calculation of Points multiply by 20	..	..	..	..	.88 .97	.92 1.12	.62 1.09	.72 .79
Actual weight of Solids other than Fat, in lbs	..	..	..	..	17.6 19.4	18.4 22.4	12.4 21.8	14.4 15.8
Calculation of Points multiply by 4	..	..	..	..	2.50 2.18	1.82 2.72	2.2 2.22	2.17 2.10
Points	..	..	..	..	10.00 8.72	7.28 10.88	8.80 8.88	8.68 8.40
For time since Calving	..	..	..	..	—	2.7	2.0	4.6
For weight of Milk	..	..	..	..	54.2	64.2	50.6	50.1
For weight of Fat	..	..	..	..	37.0	40.8	34.2	30.2
For weight of Solids other than Fat	..	..	..	..	18.7	18.2	17.7	17.1
Total	..	..	..	..	109.9	125.9	104.5	102.0
Deductions	..	..	..	..	—	10.0	10.0	10.0
Points gained	..	..	..	..	109.9	115.9	94.5	92.0
Remarks and Awards	..	..	..	..	2nd Prize	1st Prize.		
	..	..	..	..	Prize.	3rd		

CLASS 3.—LINCOLNSHIRE RED SHORTHORN COWS—Continued.

Number	..	..	..	..	..	58
Name ..	..	..	..	..	..	Brucebridge No. 17B
Age ..	..	..	..	..	..	4 yr. 11 m. 1 w.
Number of Calves ..	..	..	..	..	..	3
Last Calved ..	..	..	..	..	..	July 7.
Days since Calving ..	..	..	..	..	..	92
Weight of Milk, 1st day	..	..	..	..	..	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	..	18.1 19.5
Total	..	..	..	..	..	18.6 18.1
Average ..	..	..	..	..	..	36.7 37.6
Percentage of Fat	..	..	..	..	..	18.3 18.8
Composition of the Milk.	..	..	..	..	..	2.95 4.16
Actual weight of Fat, in lbs.	..	..	..	..	..	9.57 9.32
Calculation of Points multiply by 20	..	..	..	..	..	12.52 13.48
Actual weight of Solids other than Fat, in lbs	..	..	..	..	..	.54 .78
Calculation of Points multiply by 4	..	..	..	..	..	10.8 15.6
Points	..	..	..	..	..	1.75 1.75
For time since Calving	..	..	..	..	..	7.00 7.00
For weight of Milk	..	..	..	..	..	5.2
For weight of Fat	..	..	..	..	..	37.1
For weight of Solids other than Fat	..	..	..	..	..	26.4
Total ..	..	..	..	..	..	14.0
Deductions ..	..	..	..	..	..	82.7
Points gained	..	..	..	..	..	10.0
Remarks and Awards	..	..	..	..	..	72.7

CLASS 4.—PEDIGREE SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS).

Number Name ..	59 Bahrahm Jessica	60 Bahrahm Pretty Pippin	61 Bonlyshe Belle	62 Ewory Sweet Duchess 3rd
Age ..	2 yr. 2 m. 12 dy.	2 yr. 4 m.	2 yr. 8 m. 3 wk.	2 yr. 10 m. 4 dy.
Number of Calves ..	1	—	—	—
Last Calved ..	Aug. 20.	Sept. 12.	Sept. 16.	Sept. 3.
Days since Calving ..	48	25	21	34
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	16.7 16.0	11.9 12.8	15.5 16.4	18.4 19.9
Total ..	15.8 14.9	13.2 12.2	17.6 7.0	17.6 20.9
Average ..	32.5 30.9	25.1 25.0	33.1 33.4	36.0 40.8
Percentage { Fat ..	16.2 15.4	12.5 12.5	16.5 16.7	18.0 20.4
Composition of { Solids other than Fat ..	3.29 3.92	2.57 3.17	3.63 3.57	1.55 2.08
the Milk. { Solids ..	9.55 9.28	9.13 8.95	9.39 9.03	9.13 8.84
Actual weight of Fat, in lbs. ..	12.84 13.20	11.70 12.12	13.02 12.60	10.68 10.92
Calculation of Points multiply by 20 ..	.53 .60	.32 .40	.60 .60	.28 .43
Actual weight of Solids other than Fat, in lbs ..	10.6 12.0	6.4 8.0	12.0 12.0	5.6 8.6
Calculation of Points multiply by 4 ..	1.55 1.42	1.14 1.12	1.55 1.50	1.65 1.80
Points { For time since Calving ..	6.20 5.68	4.56 4.48	6.20 6.00	6.60 7.20
{ For weight of Milk ..	.8	—	—	—
{ For weight of Fat ..	31.6	25.0	33.2	38.4
{ For weight of Solids other than Fat ..	22.6	14.4	24.0	14.2
Total ..	11.9	9.0	12.2	13.8
Deductions ..	66.9	48.4	69.4	66.4
Points gained ..	—	10.0	—	20.0
Remarks and Awards ..	66.9	38.4	69.4	46.4
	3rd Prize.		2nd Prize.	

CLASS 4.—PEDIGREE SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS)—Continued.

Number Name ..	63 Golden Duchess II.	65 Nelly Lee 2nd	66 Carrie 38th	67 Oxford Bride
Age ..	2 yr. 8 m. 3 w.	2 yr. 11 m. 2 w.	2 yr. 9 m. 3 w.	2 yr. 6 m.
Number of Calves ..	—	—	—	—
Last Calved ..	Sept. 15, 22	Sept. 18, 19	Sept. 8, 29	July 25, 74
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day ..	Morn. Even. 14.4 16.2	Morn. Even. 16.4 18.1	Morn. Even. 14.6 15.5	Morn. Even. 16.0 18.0
Weight of Milk, 2nd day ..	16.0 14.6	16.1 16.3	14.8 15.5	18.3 16.5
Total ..	30.4 30.8	32.5 34.4	29.4 31.0	34.3 34.5
Average ..	15.2 15.4	16.2 17.2	14.7 15.5	17.1 17.2
Percentage { Fat ..	2.15 3.05	2.99 4.58	2.32 2.62	3.19 3.77
Composition of { Solids other than Fat ..	8.97 8.87	8.89 8.46	9.40 9.14	9.15 9.09
the Milk. { Solids ..	11.12 11.92	11.88 13.04	11.72 11.76	12.34 12.86
Actual weight of Fat, in lbs. ..	.33 .46	.48 .79	.34 .40	.54 .65
Calculation of Points multiply by 20 ..	6.6 9.2	9.6 15.8	6.8 8.0	10.8 13.0
Actual weight of Solids other than Fat, in lbs ..	1.36 1.37	1.44 1.46	1.38 1.42	1.57 1.56
Calculation of Points multiply by 4 ..	5.44 5.48	5.76 5.84	5.52 5.68	6.28 6.24
Points { For time since Calving ..	—	—	—	3.4
{ For weight of Milk ..	30.6	33.4	30.2	34.3
{ For weight of Fat ..	15.8	25.4	14.8	23.8
{ For weight of Solids other than Fat ..	10.9	11.6	11.2	12.5
Total ..	57.3	70.4	56.2	74.0
Deductions ..	10.0	20.0	20.0	—
Points gained ..	47.3	50.4	36.2	74.0
Remarks and Awards ..	..	..	..	1st Prize.

CLASS 4.—PEDIGREE SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS)—Continued.

Number	..	..	..	..	68
Name ..	..	..	..	..	Wild Cran 12th
Age ..	..	..	..	..	2 yr. 11 m. 2 w.
Number of Calves	..	..	..	..	—
Last Calved ..	..	..	..	..	Sept. 9th.
Days since Calving ..	..	..	..	..	28
Weight of Milk, 1st day	..	..	..	..	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	18.9 19.5
Total	..	..	..	..	19.4 18.2
Average ..	..	..	..	..	38.3 37.7
Percentage	..	..	..	..	19.1 18.8
Composition of	..	..	..	..	2.66 3.47
the Milk.	..	..	..	..	9.14 8.93
Actual weight of Fat, in lbs.	..	..	..	..	11.80 12.40
Calculation of Points multiply by 20	..	..	..	..	.51 .65
Actual weight of Solids other than Fat, in lbs	..	..	..	..	10.2 13.0
Calculation of Points multiply by 4	..	..	..	..	1.75 1.68
Points	..	..	..	..	7.00 6.72
For time since Calving	..	..	..	..	37.9
For weight of Milk	..	..	..	..	23.2
For weight of Fat	..	..	..	..	13.7
For weight of Solids other than Fat	..	..	..	..	74.8
Total ..	..	..	..	..	10.0
Deductions	..	..	..	..	64.8
Points gained	..	..	..	..	Reserve.
Remarks and Awards	..	..	..	..

CLASS 5.—SHORTHORN HEIFERS, NOT EXCEEDING THREE YEARS (NOT ELIGIBLE FOR CLASS 4).

Number	71	72	73	74
Name ..	Marjorie	Sally	Barton Ruby 12th	Barton Plenty 3th
Age ..	2 yr. 10 m. 2 w.	2 yr. 10 m. 3 w.	2 yr. 10 m. 1	2 yr. 4 m. 2 w.
Number of Calves ..	Sept. 11.	Sept. 23.	Aug. 25.	Sept. 2.
Last Calved ..	26	14	43	35
Days since Calving ..				
Weight of Milk, 1st day ..	Morn. Even.	morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	16.5 14.9	13.3 13.6	22.6 19.4	17.2 18.6
Total ..	16.5 16.6	14.0 13.1	20.7 20.2	19.6 18.9
Average ..	33.0 31.5	27.3 26.7	43.3 39.6	36.8 37.5
	16.5 15.7	13.6 13.3	21.6 19.8	18.4 18.7
Percentage (Fat	3.43 3.45	4.23 4.35	4.10 3.68	3.47 3.47
Composition of { Solids other than Fat ..	9.05 8.95	9.73 9.53	8.98 8.98	9.39 9.03
the Milk. { Solids ..	12.48 12.40	13.96 13.88	13.09 12.66	12.86 12.50
Actual weight of Fat, in lbs. ..	.56 .54	.57 .58	.88 .73	.64 .65
Calculation of Points multiply by 20 ..	11.2 10.8	11.4 11.6	17.6 14.6	12.8 13.0
Actual weight of Solids other than Fat, in lbs	1.50 1.40	1.32 1.27	1.93 1.77	1.73 1.70
Calculation of Points multiply by 4 ..	6.00 5.60	5.28 5.08	7.72 7.08	6.92 6.80
Points { For time since Calving ..			.3	
{ For weight of Milk ..	32.2	26.9	41.4	37.1
{ For weight of Fat ..	22.0	23.0	32.2	25.8
{ For weight of Solids other than Fat ..	11.6	10.4	14.8	13.7
Total ..	65.8	60.3	88.7	76.6
Deductions ..				
Points gained ..	65.8	60.3	88.7	76.6
Remarks and Awards ..	Reserve.		1st Prize.	2nd Prize.

CLASS 6.—JERSEY COWS.

Number Name ..	77 Snowfall	78 Jersey Dame	80 Gillyflower 7th	82 Mrs Viola
Age ..	6 yr. 4 m. 2 w.	8 yr. 5 m. 4 dy.	6 yr. 3 w.	8 yr. 2 m.
Number of Calves ..	—	—	—	—
Lost Calved ..	June 21. 108	Sept. 12. 25	July 13. 86	Aug. 5. 63
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	17.3 15.4	20.6 23.0	18.3 19.3	22.6 22.6
Total ..	15.7 15.2	20.4 18.6	20.1 18.0	23.4 21.6
Average ..	33.0 30.6	41.0 41.6	38.4 37.3	46.0 44.2
Percentage { Fat ..	16.5 15.3	20.5 20.8	19.2 18.6	23.0 22.1
Composition of { Solids other than Fat ..	4.97 5.08	3.20 4.05	3.73 4.41	3.47 4.53
the Milk. { Solids ..	9.13 9.12	9.08 8.59	9.41 9.09	9.03 8.57
Actual weight of Fat, in lbs. ..	14.10 14.20	12.28 12.64	13.14 13.50	12.50 13.10
Calculation of Points multiply by 20 ..	.82 .78	.66 .84	.71 .82	.80 1.00
Actual weight of Solids other than Fat, in lbs ..	16.4 15.6	13.2 16.8	14.2 16.4	16.0 20.0
Calculation of Points multiply by 4 ..	1.50 1.40	18.6 1.78	1.77 1.70	2.08 1.90
Points { For time since Calving ..	6.00 5.60	7.44 7.12	7.08 6.80	8.32 7.60
{ For weight of Milk ..	6.8	—	4.6	2.3
{ For weight of Fat ..	31.8	41.3	37.8	45.1
{ For weight of Solids other than Fat ..	32.0	30.0	30.6	36.0
Total ..	11.6	14.6	13.9	15.9
Deductions ..	82.2	85.9	86.9	99.3
Points gained ..	—	—	—	—
Remarks and Awards ..	82.2	85.9	86.9	99.3
				2nd Prize equal with 89.

Class 6.—JERSEY COWS—Continued.

Number Name ..	..	..	..	83 Lovely Venus	85 Vanilla II.	86 Godlington Pipkin II.	87 Beauty
Age ..	..	..	..	6 yr. 1 wk.	8 yr. 6 m. 2 w.	5 yr. 7 m. 1 w.	5 yr. 7 m. 3 w.
Number of Calves	..	..	..	5	May 10.	July 7.	Aug. 28.
Last Calved ..	..	..	..	138	150	92	40
Days since Calving ..	..	..	..	..	..	..	..
Weight of Milk, 1st day	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	..	..	..	20.3 18.0	18.8 18.3	23.0 20.9	16.6 19.6
Total ..	..	..	..	22.4 21.2	17.4 16.5	20.4 17.6	17.6 17.7
Average ..	..	..	..	42.7 39.2	36.2 34.8	43.4 38.5	34.2 37.3
Percentage of Fat	..	..	..	21.3 19.6	18.1 17.4	21.7 19.2	17.1 18.6
Composition of the Milk.	..	..	..	4.03 3.61	4.33 5.85	4.46 5.34	3.47 5.89
Actual weight of Fat, in lbs.	..	..	..	9.27 9.11	8.81 8.51	9.36 8.76	9.63 9.17
Calculation of Points multiply by 20	..	..	..	13.30 12.72	13.14 14.36	13.82 14.10	13.10 15.06
Actual weight of Solids other than Fat, in lbs	..	..	..	.86 .71	.78 1.01	.97 1.02	.69 1.10
Calculation of Points multiply by 4	..	..	..	17.2 14.2	15.6 20.2	19.4 20.4	11.8 22.0
Actual weight of Solids other than Fat, in lbs	..	..	..	1.98 1.79	1.60 1.48	2.02 1.68	1.65 1.71
Calculation of Points multiply by 4	..	..	..	7.92 7.16	6.40 5.92	8.08 6.72	6.60 6.84
Points gained	..	..	..	9.8	11.0	5.2	—
For time since Calving	..	..	..	40.9	35.5	40.9	35.7
For weight of Milk	..	..	..	31.4	35.8	39.8	33.8
For weight of Fat	..	..	..	15.1	12.3	14.8	13.4
For weight of Solids other than Fat	..	..	..	97.2	94.6	100.7	82.9
Total ..	..	..	..	—	—	—	—
Deductions ..	..	..	..	97.2	94.6	100.7	82.9
Points gained	..	..	..	—	—	—	—
Remarks and Awards	..	..	..	Reserve and Highly Commended	—	1st Prize Reserve for Lord Mayor's Cup	—

CLASS 6.—JERSEY COWS—Continued

Number Name ..	88 Muscatoh 4 yr. 7 m. — May 28, 132	89 Post Obit 4 yr. 6 m. — April 20, 170	90 Malvoisie 3 yr. 1 m. — July 22, 77	91 Lady Sybil 4 yr. 4 m. 2 w. 3 June 19, 110
Age
Number of Calves
Last Calved
Days since Calving
Weight of Milk, 1st day
Weight of Milk, 2nd day
Total
Average
Percentage { Fat
Composition of { Solids other than Fat
the Milk. { Solids
Actual weight of Fat, in lbs.
Calculation of Points multiply by 20
Actual weight of Solids other than Fat, in lbs.
Calculation of Points multiply by 4
{ For time since Calving
Points { For weight of Milk
{ For weight of Fat
{ For weight of Solids other than Fat
Total
Deductions
Points gained
Remarks and Awards

CLASS 6.—JERSEY COWS—Continued.

Number Name ..	..	..	..	92 Marion's Hope	93 Ida of Jersey	94 Miss Loates	95 Loulah 3rd
Age ..	..	..	..	6 yr. 4 m. 2 w. — Feb. 28, 222	5 yr. 3 m. 2 w. — April 21, 169	4 yr. 2 m. 3 w. — Sept. 6, 31	3 yr. 11 m. 2 w. — Sept. 20, 17
Number of Calves ..	..	..	..	Morn. Even. 11.5 11.5	Morn. Even. 8.8 10.3	Morn. Even. 13.0 14.1	Morn. Even. 17.1 19.8
Last Calved ..	..	..	..	11.6 11.4	8.4 10.7	12.9 14.1	17.6 14.3
Days since Calving ..	..	..	..	23.1 22.9	17.2 21.0	25.9 28.2	34.7 34.1
Weight of Milk, 1st day ..	..	..	..	11.5 11.4	8.6 10.5	12.9 14.1	17.3 17.0
Weight of Milk, 2nd day ..	..	..	..	5.64 5.01	3.59 3.97	3.23 4.54	2.97 4.57
Total ..	..	..	..	9.14 8.79	9.65 9.43	9.53 9.00	9.63 8.63
Average ..	..	..	..	14.78 13.80	13.24 13.40	12.76 13.54	12.60 13.20
Percentage (Fat ..	..	..	..	.65 .57	.31 .42	.42 .64	.51 .78
Composition of the Milk. { Solids ..	..	..	..	13.0 11.4	6.2 8.4	8.4 12.8	10.2 15.6
Actual weight of Fat, in lbs. ..	..	..	..	1.05 1.00	.83 .99	1.23 1.27	1.67 1.47
Calculation of Points multiply by 20 ..	..	..	..	4.20 4.00	3.32 3.96	4.92 5.08	6.68 5.88
Actual weight of Solids other than Fat, in lbs ..	..	..	..	12.0	12.0	27.0	34.3
Calculation of Points multiply by 4 ..	..	..	..	22.9	19.1	21.2	23.8
Points { For time since Calving ..	..	..	..	24.4	14.6	10.0	12.6
For weight of Milk ..	..	..	..	8.2	7.3	58.2	72.7
For weight of Fat ..	..	..	..	67.5	53.0	—	10.0
For weight of Solids other than Fat ..	..	..	..	—	—	58.2	62.7
Total ..	..	..	..	67.5	53.0	—	—
Deductions ..	..	..	..	—	—	—	—
Points gained ..	..	..	..	67.5	53.0	—	—
Remarks and Awards ..	..	..	..	..	..	..	..

CLASS 9.—GUERNSEY COWS.

Number Name ..	..	..	..	139 Queen of the Rosces	140 Muriel 11th	141 Express	142 Felois
Age ..	..	..	..	10 ys. 3 w.	9 yr.	13 yr. 6 m.	11 yr. 2 m. 2 w.
Number of Calves ..	..	..	..	July 12. 87	March 25. 196	May 1. 159	June 3. 126
Last Calved ..	..	..	..	
Days since Calving ..	..	..	..	
Weight of Milk, 1st day ..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	..	..	..	21.7 19.2	15.4 14.3	11.5 11.0	13.4 13.8
Total ..	..	..	..	20.7 19.0	16.4 15.5	14.2 12.0	16.3 14.4
Average ..	..	..	..	42.4 38.2	31.8 29.8	25.7 23.0	29.7 28.2
Percentage { Fat ..	..	..	..	21.2 19.1	15.9 14.9	12.8 11.5	14.8 14.1
Composition of { Solids other than Fat ..	..	..	..	3.98 4.67	5.95 5.89	4.94 5.36	3.93 4.44
the Milk. { Solids ..	..	..	..	8.90 8.87	9.73 9.17	9.12 8.64	9.21 8.88
Actual weight of Fat, in lbs. ..	..	..	..	12.88 13.54	15.68 15.06	14.06 14.00	13.14 13.32
Calculation of Points multiply by 20 ..	..	..	..	.85 .89	.95 .88	.63 .61	.58 .62
Actual weight of Solids other than Fat, in lbs. ..	..	..	..	17.0 17.8	19.0 17.6	12.6 12.2	11.6 12.4
Calculation of Points multiply by 4 ..	..	..	..	1.9 1.68	1.55 1.37	1.17 .99	1.38 1.25
Points { For time since Calving ..	..	..	..	7.6 6.72	6.20 5.48	4.68 3.96	5.52 5.00
{ For weight of Milk ..	..	..	..	4.7	12.0	11.9	8.6
{ For weight of Fat ..	..	..	..	40.3	30.8	24.3	28.9
{ For weight of Solids other than Fat ..	..	..	..	34.8	36.6	24.8	24.0
Total ..	..	..	..	14.3	11.7	8.6	10.5
Deductions ..	..	..	..	94.1	91.1	69.6	72.0
Points gained ..	..	..	..	—	—	—	—
Remarks and Awards ..	..	..	..	94.1	91.1	69.6	72.0
	..	..	..	1st Prize.	2nd Prize.		

CLASS 9.—GUERNSEY COWS—Continued.

Number	..	..	..	..	..	144
Name	..	..	..	..	..	Rachel 2nd
Age	..	..	..	..	..	10 yr. 6 m.
Number of Calves	..	..	..	..	..	7
Last Calved	..	..	..	..	..	July 11.
Days since Calving	..	..	..	..	..	88
Weight of Milk, 1st day	..	..	..	..	..	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	..	21.2 20.9
Total	..	..	..	..	..	24.1 21.3
Average	..	..	..	..	..	45.3 42.2
Percentage of Fat	..	..	..	..	..	22.6 21.1
Composition of { Fat	..	..	..	..	..	3.66 4.07
the Milk. { Solids other than Fat	..	..	..	..	..	8.44 8.27
Actual weight of Fat, in lbs.	..	..	..	..	..	12.10 12.34
Calculation of Points multiply by 20	..	..	..	..	..	.83 .86
Actual weight of Solids other than Fat, in lbs.	..	..	..	..	..	16.6 17.2
Calculation of Points multiply by 4	..	..	..	..	..	1.90 1.75
Points { For time since Calving	..	..	..	..	..	7.60 7.00
{ For weight of Milk	..	..	..	..	..	4.8
{ For weight of Fat	..	..	..	..	..	43.7
{ For weight of Solids other than Fat	..	..	..	..	..	33.8
Total	..	..	..	..	..	14.6
Deductions	..	..	..	..	..	96.9
Points gained	..	..	..	..	..	20.0
Remarks and Awards	..	..	..	..	..	76.9

CLASS 11.—RED POLLED COWS.

Number Name ..	149 Clarissa	151 Rossway Lady	152 Cheddar	153 Mona
Age ..	9 yr. 10 m.	9 yr. 6 m. 1 w.	4 yr. 11 m. 3 w.	6 yr. 9 m. 1 w.
Number of Calves ..	8	4	1	4
Last Calved ..	April 24.	Sept. 10.	Sept. 20.	Aug. 7.
Days since Calving ..	166	27	17	61
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	21.0 19.3	22.4 21.3	20.6 20.3	17.9 16.5
Total ..	20.0 20.8	22.6 21.7	22.6 22.0	18.6 15.7
Average ..	41.0 40.1	45.0 43.0	43.2 42.5	36.5 32.2
Percentage (Fat ..	20.5 20.0	22.5 21.5	21.6 21.2	18.2 16.1
Composition of { Fat ..	3.60 3.68	3.60 4.02	2.74 2.68	3.97 4.00
the Milk. { Solids other than Fat ..	8.78 8.42	9.24 9.14	9.14 8.92	9.31 9.32
Actual weight of Fat, in lbs. ..	12.38 12.10	12.84 13.16	11.88 11.60	13.28 13.32
Calculation of Points multiply by 20 ..	.74 .73	.81 .86	.59 .57	.72 .64
Actual weight of Solids other than Fat, in lbs ..	14.8 14.6	16.2 17.2	11.8 11.4	14.4 12.8
Calculation of Points multiply by 4 ..	1.80 1.68	2.08 1.96	1.98 2.00	1.7 1.50
{ For time since Calving ..	7.2 6.72	8.32 7.84	7.92 8.00	6.8 6.00
Points { For weight of Milk ..	12.0	44.0	42.8	2.1
{ For weight of Fat ..	40.5	33.4	23.2	34.3
{ For weight of Solids other than Fat ..	13.9	16.2	15.9	27.2
Total ..	95.8	93.6	81.9	76.4
Deductions ..	10.0	—	20.0	—
Points gained ..	85.8	93.6	61.9	76.4
Remarks and Awards ..	1st Prize.			

CLASS 11.—RED POLLED COWS—Continued.

Number	154	155	156	157
Name	Red Diamond	Sudbourne Princess	Sudbourne Belle Dotty	Sudbourne Belle Dotty 1st
Age	4 yr. 10 m. 2 w.	3 yr. 9 m. 2 w.	7 yr. 5 m.	4 yr. 1 m. 1 w.
Number of Calves	—	2	5	2
Last Calved	Aug. 19.	Aug. 8.	April 18.	Aug. 22.
Days since Calving	49	60	172	46
Weight of Milk, 1st day	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	18.7 18.9	14.6 14.3	16.2 15.3	20.3 18.5
Total	15.6 17.2	15.7 15.0	15.7 14.8	21.2 18.8
Average	34.3 36.1	30.3 29.3	31.9 30.1	41.5 37.3
Percentage	17.1 18.0	15.1 14.6	15.9 15.0	20.7 18.6
Composition of { Fat	3.44 3.50	3.25 3.53	2.67 3.42	3.07 3.03
the Milk. { Solids other than Fat	9.46 8.76	9.19 8.97	9.37 9.32	9.15 9.03
Actual weight of Fat, in lbs.	12.90 12.26	12.44 12.50	12.04 12.74	12.22 12.06
Calculation of Points multiply by 20	.59 .63	.49 .51	.42 .51	.63 .56
Actual weight of Solids other than Fat, in lbs.	11.8 12.6	9.8 10.2	8.4 10.2	12.6 11.2
Calculation of Points multiply by 4	1.6 1.58	1.40 1.30	1.5 1.40	1.9 1.68
	6.4 6.32	5.6 5.20	6.0 5.60	7.6 6.72
Points { For time since Calving	.9	2.0	12.0	.6
{ For weight of Milk	35.1	29.7	30.9	39.3
{ For weight of Fat..	24.4	20.0	18.6	23.8
{ For weight of Solids other than Fat	12.7	10.8	11.6	14.3
Total ..	73.1	62.5	73.1	78.0
Deductions ..	—	—	10.0	—
Points gained..	73.1	62.5	63.1	78.0
Remarks and Awards	..	..	..	..

CLASS II.—RED POLLED COWS—Continued.

Number	..	..	..	..	158
Name ..	..	..	..	..	Eva
Age ..	..	..	..	..	11 yr. 8 m. 2 w.
Number of Calves	..	..	..	..	7
Last Calved ..	..	..	..	..	Sept. 1.
Days since Calving ..	..	..	..	..	36
Weight of Milk, 1st day	..	..	..	..	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	16.3 14.8
Total	..	..	..	..	16.0 17.8
Average ..	..	..	..	..	32.3 32.6
Percentage	..	..	..	..	16.1 16.3
Composition of	..	..	..	..	4.66 16.3
the Milk.	..	..	..	..	9.06 8.95
Actual weight of Fat, in lbs. . .	..	..	..	..	13.72 13.14
Calculation of Points multiply by 20	..	..	..	..	.75 .68
Actual weight of Solids other than Fat, in lbs	..	..	..	..	15.0 13.6
Calculation of Points multiply by 4	..	..	..	..	1.45 1.45
Points	..	..	..	..	5.80 5.80
For time since Calving	..	..	..	..	—
For weight of Milk	..	..	..	..	32.4
For weight of Fat	..	..	..	..	28.6
For weight of Solids other than Fat	..	..	..	..	11.6
Total	..	..	..	..	72.6
Deductions	..	..	..	..	—
Points gained	..	..	..	..	72.6
Remarks and Awards	..	..	..	..

CLASS 12.—RED POLLED HEIFERS (NOT EXCEEDING THREE YEARS).

Number Name..	..	..	..	159 Cressida	160 Smith's Wisdom	161 Sudbourne Molly B	162 Sudbourne Albignall 2nd
Age ..	..	..	..	2 yr. 9 m.	2 yr. 6 m.	2 yr. 1 m. 2 w.	2 yr. 1 m. 2 w.
Number of Calves ..	..	..	..	1	—	1	1
Last Calved ..	..	..	..	Aug. 29,	Aug. 21,	June 24,	Aug. 10,
Days since Calving ..	..	..	..	39	47	105	58
Weight of Milk, 1st day ..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	..	..	..	14.2 14.4	17.7 17.8	15.6 14.5	9.2 8.7
Total ..	..	..	..	14.2 13.3	19.0 17.5	16.9 15.7	10.5 8.5
Average ..	..	..	..	28.4 27.7	36.7 35.3	32.5 30.2	19.7 17.2
Percentage { Fat ..	..	..	..	14.2 13.8	18.3 17.6	16.2 15.1	9.8 8.6
Composition of { Solids other than Fat..	..	..	..	3.43 3.78	2.93 3.32	3.69 3.69	4.07 3.50
the Milk. { Solids ..	..	..	..	9.45 9.32	9.17 8.58	9.03 9.21	9.35 9.34
Actual weight of Fat, in lbs. ..	..	..	..	12.88 13.10	12.10 11.90	12.72 12.90	13.42 12.84
Calculation of Points multiply by 20 ..	..	..	..	.40 .52	.54 .58	.60 .56	.40 .30
Actual weight of Solids other than Fat, in lbs ..	..	..	..	9.8 10.4	10.8 11.6	12.0 11.2	8.0 6.0
Calculation of Points multiply by 4 ..	..	..	..	1.35 1.28	1.67 1.50	1.46 1.40	.92 .80
Points { For time since Calving ..	..	..	..	5.40 5.12	6.68 6.00	5.84 5.60	3.68 3.20
{ For weight of Milk ..	..	..	..	.7		6.5	1.8
{ For weight of Fat ..	..	..	..	28.0	35.9	31.3	18.4
{ For weight of Solids other than Fat ..	..	..	..	20.2	22.4	23.2	14.0
Total ..	..	..	..	10.5	12.7	11.4	6.9
Deductions ..	..	..	..	58.7	71.7	72.4	41.1
Points gained..	..	..	..	—	10.0	—	—
Remarks and Awards ..	..	..	..	58.7	61.7	72.4	41.1
	..	..	..		Reserve.	1st Prize.	

CLASS 13.—AYRSHIRE COWS.

Number Name ..	163 Huxton TTBbie	164 Dallible Bella 2nd	165 Dallible Daisy Bell	166 Mary
Age ..	3 yr. 2 w.	7 yr.	7 yr. 9 m. 1 w.	5 yr. 2 m. 3 w.
Number of Calves ..	—	—	—	—
Last Calved ..	Aug. 20. 48	Aug. 30. 38	Feb. 20. —	Sept. 23. 14
Days since Calving ..	..	..	..	..
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	16.3 17.0	21.4 23.9	15.4 15.7	21.7 20.0
Total ..	16.4 17.4	23.8 22.2	14.2 14.4	24.3 21.1
Average ..	32.7 34.4	45.2 46.1	29.6 30.1	46.0 41.1
Percentage (Fat ..	16.3 17.2	22.6 23.0	14.8 15.0	23.0 20.5
Composition of { Solids other than Fat ..	2.30 3.26	2.04 3.79	2.19 3.66	2.89 3.22
the Milk. { ..	9.20 9.04	8.92 8.47	8.43 8.10	8.45 8.38
Actual weight of Fat, in lbs. ..	11.50 12.30	10.96 12.26	10.62 11.76	11.34 11.60
Calculation of Points multiply by 20 ..	.38 .56	.46 .87	.32 .53	.66 .66
Actual weight of Solids other than Fat, in lbs. ..	7.6 11.2	9.2 17.4	6.4 11.0	13.2 13.2
Calculation of Points multiply by 4 ..	1.50 1.55	2.02 1.95	1.25 1.21	1.95 1.72
Points { For time since Calving ..	6.0 6.20	8.08 7.80	5.00 4.84	7.80 6.88
{ For weight of Milk ..	.8	—	12.0	—
{ For weight of Fat ..	33.5	45.6	29.8	43.5
{ For weight of Solids other than Fat ..	18.8	26.6	17.4	26.4
Total ..	12.20	15.9	9.8	14.7
Deductions ..	65.3	88.1	69.0	84.6
Points gained ..	10.0	20.0	30.0	30.0
Remarks and Awards ..	55.3	68.1	39.0	54.6

CLASS 13.—AYRSHIRE COWS—Continued.

Number Name ..	..	..	..	167 Folly	168 Spotty
Age ..	..	..	..	6 yr. 1 m.	4 yr. 10 m.
Number of Calves ..	..	..	..	Sept. 18,	2
Last Calved ..	..	..	..	19	36
Days since Calving ..	..	..	..
Weight of Milk, 1st day ..	..	..	..	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	..	..	..	18.0 18.9	23.9 24.7
Total ..	..	..	..	20.5 15.8	26.6 25.4
Average ..	..	..	..	38.5 34.7	50.5 50.1
Percentage { Fat ..	..	..	..	19.2 17.3	25.2 25.0
Composition of { Solids other than Fat ..	..	..	..	3.91 3.54	2.95 3.83
the Milk. { Solids ..	..	..	..	8.79 8.70	9.13 8.45
Actual weight of Fat, in lbs. ..	..	..	..	12.70 12.24	12.08 12.28
Calculation of Points multiply by 20 ..	..	..	..	.75 .61	.75 .96
Actual weight of Solids other than Fat, in lbs	..	..	..	15.0 12.2	15.0 19.2
Calculation of Points multiply by 4 ..	..	..	..	1.68 1.50	2.32 2.11
Points { For time since Calving ..	..	..	..	6.72 6.00	9.28 8.44
{ For weight of Milk ..	..	..	..
{ For weight of Fat ..	..	..	..	36.5	50.2
{ For weight of Solids other than Fat ..	..	..	..	27.2	34.2
Total ..	..	..	..	12.7	17.7
Deductions ..	..	..	..	76.4	102.1
Points gained	..	..	..	—	20.0
Remarks and Awards ..	..	..	..	76.4	82.1

CLASS 15.—KERRY COWS.

Number Name ..	172 Buckhurst Peaceful	173 Buckhurst Zingara	174 Hardwick Crocus	175 Hardwick Pearl
Age ..	9 yr. 3 m. 1 w.	7 yr. 3 m.	7 yr.	6 yr. 4 m. 3 w.
Number of Calves ..	6	3	—	—
Last Calved ..	Sept. 11.	Sept. 8.	June 20.	May 24.
Days since Calving ..	26	29	109	136
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	22.9 21.9	20.6 21.4	12.7 10.8	16.7 14.2
Total ..	23.2 22.4	21.5 18.9	13.4 12.6	15.8 14.6
Average ..	46.1 44.3	42.1 40.3	26.1 23.4	32.5 28.8
Percentage of Fat ..	23.0 22.1	21.0 20.1	13.0 11.7	16.2 14.4
Composition of the Milk. { Fat ..	4.64 4.77	3.34 3.76	3.49 3.34	3.47 3.37
{ Solids other than Fat ..	9.44 8.89	8.88 8.50	9.51 9.36	9.49 9.37
{ Solids ..	14.08 13.66	12.22 12.26	13.00 12.70	12.96 12.74
Actual weight of Fat, in lbs. ..	1.07 1.06	.70 .76	.45 .39	.56 .48
Calculation of Points multiply by 20 ..	21.4 21.2	14.0 15.2	9.0 7.8	11.2 9.6
Actual weight of Solids other than Fat, in lbs ..	2.18 1.96	1.85 1.70	1.25 1.10	1.54 1.35
Calculation of Points multiply by 4 ..	8.72 7.84	7.40 6.80	5.00 4.40	6.16 5.40
Points { For time since Calving ..	—	—	6.9	9.6
{ For weight of Milk ..	45.1	41.1	24.7	30.6
{ For weight of Fat ..	42.6	29.2	16.8	20.8
{ For weight of Solids other than Fat ..	16.6	14.2	9.4	11.6
Total ..	104.3	84.5	57.8	72.6
Deductions ..	—	—	—	—
Points gained ..	104.3	84.5	57.8	72.6
Remarks and Awards ..	1st Prize and Lord Mayor's Cup.	2nd Prize.		

CLASS 15.—KERRY COWS—Continued.

Number Name ..	..	..	..	..	176 Belvedere Nora 7 yr. 6 m. 1 w. May 12. 148	178 Caythorpe Cockhorn — July 22. 77
Age ..	..	..	..	..	Morn. Even.	Morn. Even.
Number of Calves ..	..	..	..	..	15.3 9.7	17.0 16.6
Last Calved ..	..	..	..	..	14.1 11.9	17.7 15.0
Days since Calving ..	..	..	..	..	29.4 21.6	34.7 31.6
Weight of Milk, 1st day ..	..	..	..	..	14.7 10.8	17.3 15.8
Weight of Milk, 2nd day ..	..	..	..	..	4.24 3.00	3.69 3.82
Total ..	..	..	..	..	8.58 8.41	8.63 8.50
Average ..	..	..	..	..	12.82 11.41	12.32 12.32
Percentage (Fat ..	..	..	..	..	.62 .32	.64 .60
Composition of { Solids other than Fat ..	..	..	..	..	12.4 6.4	12.8 12.0
the Milk. { Solids ..	..	..	..	..	1.26 .91	1.48 1.34
Actual weight of Fat, in lbs. ..	..	..	..	..	5.04 3.64	5.92 5.36
Calculation of Points multiply by 20 ..	..	..	..	..	10.8	3.7
Actual weight of Solids other than Fat, in lbs ..	..	..	..	..	25.5	33.1
Calculation of Points multiply by 4 ..	..	..	..	..	18.8	24.8
Points { For time since Calving ..	..	..	..	..	8.7	11.3
{ For weight of Milk ..	..	..	..	..	63.8	72.9
{ For weight of Fat ..	..	..	..	..	10.0	—
{ For weight of Solids other than Fat ..	..	..	..	..	53.8	72.9
Total ..	..	..	..	..
Deductions ..	..	..	..	..
Points gained ..	..	..	..	..
Remarks and Awards ..	..	..	..	..

CLASS 16.—DEXTER COWS.

Number Name ..	179 Compton Dark Beauty	180 Backhurst Juno	181 Higham's Duchess	182 Don Gordonia
Age ..	8 yr. 6	7 yr. 4 m. 2 w. 5	8 yr. 9 m. 3 w. 7	8 yr. 5
Number of Calves ..	Aug. 10. 58	May 18. 142	Aug. 24. 44	Aug. 22. 46
Last Calved ..				
Days since Calving ..				
Weight of Milk, 1st day ..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day ..	16.8 16.7	19.2 15.9	10.7 10.1	24.1 22.4
Total ..	17.7 16.0	19.9 17.3	11.0 10.8	21.4 21.5
Average ..	34.5 32.7	39.1 33.2	21.7 20.9	45.5 43.9
Percentage of Fat ..	17.2 16.3	19.5 16.6	10.8 10.4	22.7 21.9
Composition of Solids other than Fat ..	2.81 3.15	2.82 2.47	4.36 4.88	3.12 4.63
the Milk. ..	9.03 8.71	8.78 8.83	9.34 8.92	9.04 8.71
Actual weight of Fat, in lbs. ..	11.84 11.86	11.60 11.30	13.70 13.80	12.16 13.34
Calculation of Points multiply by 20 ..	.48 .51	.55 .41	.47 .51	.71 1.01
Actual weight of Solids other than Fat, in lbs. ..	9.6 10.2	11.0 8.2	9.4 10.2	14.2 20.2
Calculation of Points multiply by 4 ..	1.55 1.42	1.71 1.46	1.0 .93	2.06 1.91
Points ..	6.20 5.68	6.84 5.84	4.0 3.72	8.24 7.64
For time since Calving ..	1.8	10.2	.4	.6
For weight of Milk ..	33.5	36.1	21.2	44.6
For weight of Fat ..	19.8	19.2	19.6	34.4
For weight of Solids other than Fat ..	11.9	12.7	7.7	15.9
Total ..	67.0	78.2	48.9	95.5
Deductions ..	10.0	20.0	—	—
Points gained ..	57.0	58.2	48.9	95.5
Remarks and Awards ..				1st Prize.

CLASS 16.—DEXTER COWS—Continued.

Number Name ..	..	..	..	..	183 Cowbridge Dainty Disb.	184 La Mancha Sweet Nell
Age ..	..	..	..	6 yr. 6 m.	7 yr. 5	
Number of Calves	..	..	..	4		
Last Calved ..	..	..	..	March 12. 209	March 29. 192	
Days since Calving ..	..	..	..
Weight of Milk, 1st day	..	..	..	Morn. Even.	Morn. Even.	
Weight of Milk, 2nd day	..	..	..	12.8 12.2	14.1 12.9	
Total ..	..	..	..	15.0 12.8	14.4 11.4	
Average ..	..	..	..	27.8 25.0	28.5 24.3	
Percentage { Fat ..	..	..	..	13.9 12.5	14.2 12.1	
Composition of { Solids other than Fat ..	..	..	..	4.23 4.33	4.63 4.42	
the Milk. { Solids ..	..	..	..	9.23 8.97	8.89 8.78	
Actual weight of Fat, in lbs. ..	..	..	..	13.46 13.30	13.52 13.20	
Calculation of Points multiply by 20 ..	..	..	..	.59 .54	.66 .53	
Actual weight of Solids other than Fat, in lbs	..	..	..	11.8 10.8	13.2 10.6	
Calculation of Points multiply by 4 ..	..	..	..	1.28 1.12	1.26 1.06	
{ For time since Calving ..	..	..	..	5.12 4.48	5.04 4.24	
{ For weight of Milk ..	..	..	..	12.0	12.0	
{ For weight of Fat ..	..	..	..	26.4	26.3	
{ For weight of Solids other than Fat ..	..	..	..	22.6	23.8	
Total ..	..	..	..	9.6	9.3	
Deductions ..	..	..	..	70.0	71.4	
Points gained ..	..	..	..	—	—
Remarks and Awards ..	..	..	..	70.0	71.4	

CLASS 22.—GOATS (ANY VARIETY).

Number Name ..	..	..	..	..	248 Coythorne Pineapple	249 Nanny	253 Tritia	254 Brookbourne Topsey
Age ..	..	..	..	..	—	7 yr. 6 m. 3	7 yr. 5 m. 3 w. 10	3 yr. 5 m. 2 w. 3
Number of Kids Last Kided ..	..	..	..	..	3 July 14. 85	May 11. 149	April 30. 160	April 2. 188
Days since Kidding ..	..	..	..	..	..	..	..	..
Weight of Milk, 1st day	..	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	..	..	..	..	2-3 2-1	1-5 1-4	2-1 2-5	2-7 2-3
Total	..	..	..	..	2-5 2-0	1-6 1-0	2-5 2-3	2-6 1-9
Average ..	..	..	..	..	4-8 4-1	3-1 2-4	4-6 4-8	5-3 4-2
Percentage	..	..	..	..	2-4 2-05	1-55 1-2	2-30 2-40	2-65 2-10
Composition of	..	..	..	..	5-45 5-56	5-51 5-80	2-91 2-20	3-60 3-86
the Milk.	..	..	..	..	9-81 9-68	9-29 8-80	7-73 7-96	8-26 8-34
Actual weight of Fat, in lbs.	..	..	..	..	15-26 15-24	14-80 14-60	10-64 10-16	11-86 12-20
Calculation of Points multiply by 20	..	..	..	..	13 11-4	10-85 10-70	10-67 10-53	11-09 11-08
Actual weight of Solids other than Fat, in lbs	..	..	..	..	2-6 2-28	1-70 1-40	1-34 1-06	1-90 1-62
Calculation of Points multiply by 4	..	..	..	..	23 20	143 106	178 190	220 175
Points	..	..	..	..	92 80	572 424	712 760	880 700
For time since Kidding	..	..	..	..	1-41	2-48	2-66	3-13
For weight of Milk	..	..	..	..	4-45	2-75	4-70	4-75
For weight of Fat	..	..	..	..	4-88	3-10	2-40	3-52
For weight of Solids other than Fat	..	..	..	..	1-72	99	1-47	1-58
Total	..	..	..	..	12-46	9-32	11-23	12-98
Deductions	..	..	..	..	—	—	2-0	2-0
Points gained	..	..	..	..	12-46	9-32	9-23	10-98
Remarks and Awards	..	..	..	..	2nd Prize.	..	..	..

Highly Commended
and placed in
County Challenge Cup with
total of 2098 points.

CLASS 22.—GOATS (ANY VARIETY)—Continued.

Number Name ..	..	..	..	256 Mmeche XI	260 Broxbourne Venus	261 Broxbourne Fairy	262 Bricket Belladonna
Age ..	..	..	..	5 yr. 4	—	—	2 yr. 6 m. 4
Number of Kids	..	..	..	March 25.	March 22-07.	April 1.	March 9.
Last Kidged ..	..	..	..	196	564	189	212
Days since Kidging ..	..	..	..	
Weight of Milk, 1st day	..	..	..	Morn. Even.	Morn. Even.	Morn. Even.	Morn. Even.
Weight of Milk, 2nd day	..	..	..	2.7 2.3	1.9 1.8	1.8 1.4	.9 .7
Total	..	..	..	2.8 2.3	2.2 1.6	1.8 1.3	.9 .5
Average ..	..	..	..	5.5 4.6	4.1 3.4	3.6 2.7	1.8 1.2
	..	..	..	2.75 2.30	2.05 1.70	1.8 1.35	.90 .60
Percentage	..	..	..	4.13 3.85	3.90 3.43	3.53 3.38	6.42 6.64
Composition of	..	..	..	8.63 8.55	8.82 8.47	8.35 8.32	10.22 10.02
the Milk.	..	..	..	12.76 12.40	12.72 11.90	11.88 11.70	16.64 16.66
Actual weight of Fat, in lbs.	..	..	..	.113 .089	.080 .058	.063 .045	.058 .040
Calculation of Points multiply by 20	..	..	..	2.26 1.78	1.60 1.16	1.26 .90	1.16 .80
Actual weight of Solids other than Fat, in lbs	..	..	..	.238 .197	.181 .144	.150 .112	.092 .061
Calculation of Points multiply by 4	..	..	..	.952 .788	.724 .576	.600 .448	.368 .244
Points	..	..	..	3.26	6.00	3.15	3.53
For time since Kidging ..	..	..	..	5.05	3.75	3.15	1.50
For weight of Milk ..	..	..	..	4.04	2.76	2.16	1.96
For weight of Fat ..	..	..	..	1.74	1.30	1.05	.61
For weight of Solids other than Fat	..	..	..	14.09	13.81	9.51	7.60
Total ..	..	..	..	1.0	2.0	2.0	—
Deductions ..	..	..	..	13.09	11.81	7.51	7.60
Points gained	..	..	..	
Remarks and Awards	..	..	..	1st Prize.	Reserve and Very Highly Commended.		

CLASS 22.—GOATS (ANY VARIETY)—Continued.

Number Name ..	..	..	..	265 Broxbourne Sandy	277 Coplethorne Plum
Age ..	..	..	..	3 yr. 3 m. 3 w. 4	5 yr. 5 m. 2 w. 4
Number of Kids ..	..	..	..	April 2-07. 553	Aug. 8. 60
Last Kidding ..	..	..	..
Days since Kidding ..	..	..	..
Weight of Milk, 1st day ..	..	..	..	Morn. Even. 2-0 2-0	Morn. Even. 2-9 2-4
Weight of Milk, 2nd day ..	..	..	..	2-1 1-4	2-1 1-6
Total ..	..	..	..	4-1 3-4	5-0 4-0
Average ..	..	..	..	2-05 1-70	2-5 2-0
Percentage { Fat ..	..	..	..	3-06 2-84	5-46 4-61
Composition of { Solids other than Fat ..	..	..	..	8-40 8-16	9-54 9-39
the Milk. { Solids ..	..	..	..	11-46 11-00	15-00 14-00
Actual weight of Fat, in lbs. ..	..	..	..	0-61 0-48	1-40 0-92
Calculation of Points multiply by 20 ..	..	..	..	1-22 -96	2-80 1-84
Actual weight of Solids other than Fat, in lbs ..	..	..	..	172 139	240 188
Calculation of Points multiply by 4 ..	..	..	..	688 556	960 752
Points { For time since Kidding ..	..	..	..	6-00	1-0
{ For weight of Milk ..	..	..	..	3-75	4-5
{ For weight of Fat ..	..	..	..	2-18	4-64
{ For weight of Solids other than Fat ..	..	..	..	1-24	1-71
Total ..	..	..	..	13-17	11-85
Deductions ..	..	..	..	2-0	—
Points gained ..	..	..	..	11-17	11-85
Remarks and Awards ..	..	..	..	Very Highly Commended.	2nd Prize Reserved for Baroness Burdett-Goutts, Challenge Cup with total of 29-85 points.

THE BUTTER TESTS OF 1908.

By R. H. EVANS, B.Sc., University College, Reading.

The 1908 Show was held during exceptionally warm weather for the time of the year. The conditions obtaining in the Agricultural Hall during the Dairy Show week are, at the best of times, exceptional, and cows competing in the Milking and Butter-test Trials were this year further handicapped by having to spend a week in such a broiling temperature.

The Butter Tests were carried out in the usual way, and although no records were broken at the 1908 Show, still a study of the results are not only interesting, but also instructive.

The following are the scale of points :—

One point for every ounce of butter ; one point for every completed 10 days since calving, deducting the first 40 days. Maximum allowance for period of lactation, 12 points.

Fractions of ounces of butter, and incomplete periods of less than 10 days, to be worked out in decimals, and added to the total points.

In the case of cows obtaining the same number of points, the prize to be awarded to the cow that has been the longest time in milk.

No prize or certificate to be given in the case of :—

- (a) Cows under five years old failing to obtain 28 points, or in the case of Jerseys 30 points.
- (b) Cows five years old and over failing to obtain 32 points, or in the case of Jerseys 35 points.

An innovation in the management of the milk at this year's Show should perhaps be mentioned. At the previous Shows the morning's milk was held over and separated with the evening's milk. This year, however, the milk obtained at each milking was separated as soon as possible after it left the cow.

This new method of dealing with the milk is undoubtedly a great improvement upon the old system.

The churning commenced early on Thursday morning, and every care was taken to treat the cream from each individual cow in exactly the same way.

The churn and the cream in each case were reduced to 52 degrees F. before churning commenced.

The churning was entrusted to a number of trained dairy-maids. Breaking water was added at the proper stage ; an attempt was made to obtain as uniform a grain as possible ; the butter was first of all dried in a *delaitouse*, and was then well worked on a

From the appended tables it will be seen that the time it takes to churn cream from different animals varies greatly. For instance, the cream given by No. 94 only took 12 minutes to churn, while that of No. 23 only yielded its butter after having been churned for close upon three hours (174 minutes).

There was only one class for Shorthorns at the 1908 Show as far as the Butter Tests were concerned; that is, the Pedigree, Non-pedigree, and Lincoln Reds were placed together.

In this class Mr. G. B. Nelson's "Daisy" (No. 35) carried the premier honour for the second year in succession, and although this cow did not yield as much butter as she did at the 1907 Show, still 2 lbs. 10½ ozs. is a very creditable performance, and is a proof the animal is a fairly consistent butter producer.

The quality of the butter yielded by a great number of the animals competing in this class was decidedly poor. High feeding and forcing for milk production, together with the exceptional conditions existing in the Hall, which have already been referred to, had a most detrimental effect not only on the quality, but also on the colour of the butter.

Several cows yielded soft, oily butter, which was found very difficult to manage on the butter-worker, and when made up looked more of the colour and consistency of lard than of butter.

The Jersey class was not up to the usual standard, as is shown by reference to the butter ratio, which is 1 in 22.35. Still, an examination of the results in the Jersey class point to the fact that they were a much more uniform lot of animals than the Shorthorns, and that the cream is much more churnable, not only as regards the time the butter takes to come, but also in the amount of fat left in the buttermilk.

Only two Guernseys were tested, and Mr. E. A. Hambro's "Muriel 11th" obtained 42 marks.

Of the three Red Polls and the four Ayrshires which competed, not one of them obtained the minimum number of points necessary for a prize.

Of the Kerries, Countess De la Warr's "Buckhurst Peaceful" obtained 34 points, and was awarded the breed prize of £3.

Those butter-milks which on inspection and on analysis were found to contain appreciable amounts of fat were churned—some on Thursday evening and the others Friday morning—and butter varying in amount from 3½ to 15½ ozs. was obtained.

In eight cases no result was obtained, though the butter-milks were churned for over an hour.

It should be noted that the weight of butter obtained in rechurning the milk of No. 94 (a Jersey cow) was added to that obtained in the first churning. This was not done in the case of the other breeds.

BUTTER TEST—SHORTHORNS.

No. in Catalogue	Exhibitor and Name of Cow	Age on Sept. 1st y. m. w.	Date of last Calf	Number of days in Milk	Milk Yield			Butter Yield	Ratio, viz, lbs. Milk to lbs. Butter	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total number of Points	Awards
					Morn.	Even.	Total			Colour	Quality				
					lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.							
4	W. Nisbet's Ewerby Beauty	8 0 2	Aug. 7	61	29	7 29	2 39	9 1 15	30 74	Ex'tnt	Good	31 0	2 1	33 10	H. Commended
5	W. Nisbet's Ewerby Red Rose 2nd	4 7 1	Sept. 2	35	19	5 18	11 38	0 1 51	28 61	Good	Good	21 25	—	21 25	
7	Lord Rothschild's Darlington Cranford	16 11 1	April 9	181	27	7 27	10 55	1 1 13 1	29 61	V. Fair	Bad	29 75	12 0	41 75	2nd Prize of £2 & Bronze Medal
8	Lord Rothschild's Dorothy	7 5 1	Aug. 15	53	34	11 31	0 65	11 2 0	32 84	Pale	Poor	32 0	1 3	33 30	H. Commended
13	R. W. Hobbs & Sons' Primula 70th	8 8 3	April 1	189	24	0 22	3 46	3 1 10 1	27 88	Pale	Poor	26 5	12 0	38 50	H. Commended
14	R. W. Hobbs & Sons' Decentia 34th	5 11 0	Sept. 19	18	27	11 30	3 57	14 2 4	25 72	Pale	Good	36 0	—	36 00	H. Commended
16	Duke of Portland's Furbelow Cran	8 5 2	Sept. 5	32	23	2 25	2 48	4 1 8	32 16	Pale V.	Good	24 0	—	24 00	
18	Duke of Portland's Waterloo Lady Ada	9 1 3	Sept. 13	24	25	2 25	15 51	1 1 13 1	27 93	Pale V.	Good	29 25	—	29 25	
20	J. L. Shirley's Martha...	8 0 0	July 22	77	31	3 27	10 58	13 2 0 1	28 95	Pale	Good	32 50	3 7	36 20	H. Commended
21	J. L. Shirley's Maisie...	6 0 0	Sept. 21	16	30	15 30	13 61	12 2 6	26 00	Pale	Good	38 00	—	38 00	H. Commended
23	J. L. Shirley's Mollie...	7 0 0	Sept. 8	29	32	8 32	0 64	8 1 7 1	43 91	Pale V.	Fair	23 50	—	23 50	
29	John Littleton's Rose...	5 1 2	Sept. 22	15	20	0 20	0 40	0 1 12	22 85	V. Good	Poor	28 00	—	28 00	
30	Richd. E. Birch's Dairy-maid	4 10 0	Aug 17	51	17	8 19	10 37	2 0 12 1	48 44	V. Pale	Fair	12 25	1 1	13 35	

BUTTER TEST—SHORTHORNS—Continued.

No. in Catalogue	Exhibitor and Name of Cow	Age on Sept. 1st y. m. w.	Date of last Calf	Number of days in Milk	Milk Yield			Butter yield Ratio, viz. lbs. Milk to lbs. Butter	Colour and Quality of Butter		No. of Points for Lactation	Total number of Points	Awards
					Mom. lbs. ozs.	Even. lbs. ozs.	Total lbs. ozs.		Colour	Quality			
32	R. W. Hobbs & Sons' Laura 4th.	8 1	0 Sept. 11	26	29	0 28	0 57 0 1	7 3	38 40	Pale	Poor	23 75	—
34	G. B. Nelson's Pet.	5 10	0 Sept. 23	14	28	2 26	13 54 15 1	7 1	37 80	V. Good	Poor	23 25	—
35	G. B. Nelson's Daisy. . .	7 6	0 July 28	71	29	3 22	10 51 13 2	10 1	19 50	V Good	V Good	42 50	3 1 45 60 1st Prize and Silver Medal
37	G. B. Nelson's Welcome.	6 0	0 Sept. 23	14	22	5 23	7 45 12 2	0	22 87	Ex'tnt	Good	32 00	— 32 00 H. Commended
38	Thos. Jones's Sweet. . .	6 0	0 Sept. 6	31	25	7 22	3 47 10 1	1	44 82	Good	Bad	17 00	— 17 00
39	John H. Maden's Minnie	—	Aug. 24	44	35	13 25	2 60 15 2	4	27 08	Pale	Poor	36 00	4 36 40 H. Commended
40	John H. Maden's Lady Preston	—	Sept. 2	35	25	15 22	11 48 10 1	9	31 12	V. Pale	Poor	25 00	— 25 00
45	John Wilson's Daisy. . .	5 0	3 Sept. 11	26	19	7 19	2 38 9 1	0	38 56	Good	Bad	16 00	— 16 00
46	John Wilson's Red Rose	5 6	0 Sept. 7	30	29	7 30	0 59 7 1	14	31 70	Good	Good	30 00	— 30 00
47	T. Hunter's Ida.	6 0	0 Sept. 18	19	21	7 23	15 45 6 1	1 1	40 90	V. Good	Poor	17 75	— 17 75
48	T. Hunter's Queenie. . .	5 6	0 Sept. 17	20	25	11 25	0 50 11 2	6 1	20 92	V. Good	Poor	38 75	— 38 75 Reserve & V.H.C.
49	T. Hunter's Vinolia. . .	5 9	0 Sept. 14	23	17	2 18	15 36 1 1	1 1	32 25	Good	Fair	17 75	— 17 75
50	John Evens's Burton Spotted 5th	5 6	3 Aug. 11	57	26	8 22	11 49 3 1	5 1	36 60	Good	Fair	21 5	1 7 23 20

BUTTER TEST—SHORTHORNS—Continued.

No. in Catalogue	Exhibitor and Name of Cow	Age on Sept. 1st	Date of last Calf	Days in Milk	Milk Yield			Butter Yield	Ratio, viz., lbs. Butter to lbs. Butter	Colour and Quality of Butter		No. of Points for Butter	No. of Points for Lactation	Total number of Points	Awards
					Morn	Even.	Total			Colour	Quality				
		y. m. w.			lbs	ozs	lbs	ozs	lbs	ozs					
51	John Evens's Burton Profit 3rd	5 6	0 Aug. 30	38	20	5 21	0 41	5 1 12 1	22 99	Good	Fair	28 75	—	28 75	
52	John Evens's Burton Ruddy 5th	6 11	3 July	5 94	23	3 22	0 45	3 1 9 1	28 63	V. Pale	Good	25 25	5 4	30 65	
53	John Evens's Burton Nancy 5th	6 6	0 Sept. 18	19	24	10 21	11 46	5 2 4 1	20 44	Good	Fair	36 25	—	36 25	H. Commended
54	John Evens's Burton Nancy 4th	8 3	0 Sept. 1	36	29	5 26	5 55	10 2 0	27 81	Good	V. Good	32 00	—	32 00	H. Commended
55	Fred Scorer's Brace-bridge No. 102	8 6	0 Aug. 1	67	31	5 32	3 63	8 2 3	29 02	Pale	V. Good	35 00	2 7	37 70	H. Commended
56	Fred Scorer's Brace-bridge Fullerby	8 0	0 Aug. 8	60	24	5 28	13 53	2 1 11	31 48	Good	Good	27 00	2 0	29 00	
57	Fred Scorer's Cadoby Belle	6 0	0 July 13	86	25	0 25	7 50	7 1 7	35 08	Good	Good	23 00	4 6	27 60	
58	Fred Scorer's Brace-bridge No. 1713	4 11	0 July 7	92	18	2 19	8 37	10 1 8	25 08	Good	Good	24 00	5 2	29 20	
72	John Littleton's Sally..	2 10	3 Sept. 23	14	13	5 13	10 26	15 1 0	26 93	Good	Good	16 00	—	16 00	

BUTTER TEST—SHORTHORNS—Continued.

No. in Catalogue	Name of Cow	CHURNING—TIME AND TEMPERATURE			
		Time		Temperature	
		Churning began	Churning finished	Duration of Churning Minutes	Dairy Degrees
4	Ewerby Beauty	8 5	9 10	65	65
5	Ewerby Red Rose 2nd ..	7 58	8 56	58	58
7	Darlington Cranford ..	8 0	8 56	56	56
8	Dorothy	8 7	8 50	43	60
13	Primula 70th	7 54	9 5	71	58
14	Decentia 34th	7 58	8 37	39	58
16	Furbelow Cran	7 59	8 40	41	59
18	Waterloo Lady Ada ..	7 54	8 40	46	58
20	Martha	8 5	8 52	47	57
21	Maisie	7 56	8 50	54	58
23	Mollie	8 6	11 0	174	67
29	Rose	9 35	10 14	39	57
30	Dairymaid	9 45	11 12	87	60
32	Laura 4th	9 45	10 17	32	59
34	Pet	9 57	10 20	23	57
35	Daisy	9 40	10 19	39	56
37	Welcome	9 50	10 25	35	60
38	Sweet	10 23	10 48	25	56
39	Minnie	9 53	11 0	67	60
40	Lady Preston	10 34	11 11	37	56
45	Daisy	10 25	10 42	17	55
46	Red Rose	10 40	11 24	44	60
47	Ida	10 50	11 27	37	58
48	Queenie	11 26	11 48	22	57
49	Vinolia	11 2	11 25	23	58

BUTTER TEST—SHORTHORNS—Continued

No. in Catalogue	Name of Cow	CHURNING TIME—AND TEMPERATURE				
		Time		Temperature		
		Curing begins	Churning finished	Duration of churning	Dairy	Cream and Churn
				Minutes	Degrees	Degrees
50	Burton Spotted 5th	11 41	12 14	33	70	52
51	Burton Profit 3rd	11 0	11 18	18	68	52
52	Burton Ruddy 5th	11 9	12 10	61	68	52
53	Burton Nancy 5th	11 15	11 46	31	68	52
54	Burton Nancy 4th	11 38	12 15	37	70	52
55	Bracebridge No. 102	11 56	12 20	24	70	52
56	Bracebridge Fullerby	11 45	12 35	50	70	52
57	Cadeby Belle ..	11 49	12 47	58	70	52
58	Bracebridge No. 17 B.	12 20	12 51	31	70	52
72	Sally ..	11 45	12 27	42	70	52
						Buttermilk, when churning bullfied
						Degrees
						60
						56
						62
						58
						57
						61
						63
						57
						60

BUTTER TEST—JERSEYS.

No. in Catalogue	Exhibitor and Name of Cow	Date of Birth	Date of last Calf	Milk Yield			Butter Yield		Ratio, viz., lbs. milk to lb. butter	Colour and Quality of Butter.		No. of Points for period of Lactation	Awards	
				No. of Days in milk	Morn. lbs	Even. lbs	Total in 24 hours lbs	lbs ozs		lbs ozs	Colour			Quality
7	T. French's Snawfell...	May 17, 1902	June 21	108	17	415	632	101	123	18-31	Good	28-50	6-80 35-30 Certificate of Merit	
8	Mrs. Watson Kennedy's	Sept. 10, 1902	July 13	89	18	419	437	81	9	24-00	Fair	Good 25-00	4-60 29-60	
2	R. Bruce Ward's Mrs. Aug. 1, 1900	Aug. 5	63	22	10	22	10	45	41	153	22-98	Good V. Good 31-50	2-30 33-80	
3	R. Bruce Ward's Lovely Venus	Sept. 24, 1902	May 22	138	20	418	038	41	53	28-40	V. Good	Fair 21-50	9-80 31-30	
6	A. Miller-Hallett's God-dington Pipkin 2nd	Feb. 27, 1903	July 7	92	23	020	14	43	142	32	19-77	V. Good	Good 35-50	5-20 40-70 1st Prize E.J.C.S. Gold Medal
7	Jersey de Knoop's Beauty	Feb. 9, 1903	Aug. 28	40	16	10	19	10	36	41	141	19-17	Very Good 30-25	— 30-25
8	Jersey de Knoop's Muscotal	Mar. 1, 1904	May 28	132	12	811	824	01	123	13-35	V Good	Ex't 28-75	9-20 37-95 2nd Prize, Silver Medal & £5 and £1 Butter Prize	3rd Prize, Bronze Medal & £3
9	J. H. Smith-Barry's Post Obit	Mar. 23, 1904	April 20	170	18	619	837	141	83	24-98	Good	Fair 24-25	12-00 36-25 3rd Prize, Bronze Medal & £3	3-70 34-20 Certificate of Merit
10	J. H. Smith-Barry's Malvoisie	Aug. 12, 1905	July 22	77	22	420	642	101	143	22-36	Good	Good 30-50	7-00 28-25	
11	Bishop Fisher's Lady Sybil	May 13, 1904	June 19	110	16	815	1232	41	53	24-28	Fair	Fair 21-25	7-00 28-25	
20	O. F. Mosley's Marion's Hope	May 12, 1902	Feb. 28	222	11	811	823	01	23	19-62	Good	Poor 18-75	12-00 30-75	
30	O. F. Mosley's Ida of Jersey	1903	April 21	169	8	12	10	419	00	103	29-65	Good	10-25 12-00 22-25	
40	O. F. Mosley's Miss Loates	1904	Sept. 6	31	13	014	227	121	13	25-37	V. Good	Fair 17-50	— 17-50	
50	O. F. Mosley's Louthah 3rd	Oct. 17, 1904	Sept. 20	17	17	219	1236	141	3	31-05	V. Good	Fair 19-00	— 19-00	
57	French's Molly Bawn 7th	1906	April 25	165	10	14	11	822	60	121	29-22	Good	12-25 12-00 21-25	
1	F. V. Le Feuvre's Cora's Princess	1906	Mar. 8	213	10	9	10	20	41	13	18-78	Good	Fair 17-25	12-00 20-25

BUTTER TEST—JERSEYS—Continued.

No. in Catalogue	Name of Cow	CHURNING—TIME AND TEMPERATURE				
		Time		Temperature		
		Churning began	Churning finished	Duration of Churning	Dairy Degrees	Cream and Churn Degrees
				Minutes		Buttermilk, when churning finished Degrees
77	Snawfell ..	9 4	9 46	42	68	52
80	Gillyflower 7th	9 9	9 30	21	68	52
82	Mrs. Viola ..	9 19	10 12	53	68	52
83	Lovely Venus ..	9 30	10 3	33	67	52
86	Goddington Pipkin II.	9 47	10 15	28	67	52
87	Beauty ..	10 20	10 44	24	67	52
88	Muscotah ..	10 28	10 53	25	68	52
89	Post Obit ..	10 40	11 9	29	68	52
90	Malvoisie ..	10 52	11 16	24	68	52
91	Lady Sybil ..	11 2	11 39	37	68	52
92	Marion's Hope ..	11 25	12 1	36	69	52
93	Ida of Jersey ..	11 33	11 54	21	69	52
94	Miss Loutas ..	11 50	12 2	12	69	52
95	Louah 3rd ..	11 55	12 11	16	70	52
105	Molly Bawn VII.	12 12	12 44	32	70	52
131	Cora's Princess ..	12 24	1 7	43	70	52

BUTTER TEST—COWS AND HEIFERS OTHER THAN SHORTHORNS OR JERSEYS.

No. in Catalogue	Exhibitor and Name of Cow	Age on Sept. 1st	Date of last Calf	Number of days in Milk	Milk Yield			Butter Yield	Ratio, viz., lbs. Milk to lbs. Butter	Colour and Quality of Butter		No. of points for Butter	No. of points for Lactation	Total number of Points	Awards		
					Morn.	Ev n.	Total			Colour	Quality						
		y. m. w.			lbs	ozs	lbs	ozs	lbs	ozs							
40	E. A. Hambro's Muriel 11th	9 0	0 Mar.	25	15	7 14	5 29	12 1	14	15·86	Ex'Int	Ex'Int	30·00	12·00	42·00	Prize of £3	
144	Lord Rayleigh's Rachel 2nd	10 6	0 July	11	88	21	3 20	15 42	2 1	13	23·24	Ex'Int	Ex'Int	29·00	4·80	33·80	H. Commended
49	Lord Rothschild's Clarissa	9 10	0 April	24	166	21	0 19	5 40	5 1	1	37·94	Good	V. Poor	17·00	12·00	29·00	
53	Earl of Radnor's Mona.	6 9	1 Aug.	7	61	17	15 16	8 34	7 1	2	29·38	V. Pale	Fair	18·75	2·10	20·85	
54	A. Carlisle Smith's Red Diamond	4 10	2 Aug.	19	49	18	11 18	15 37	10 0	15	38·22	Pale	Fair	15·75	·90	16·65	
65	Wm. Nisbet's Daffibble Daisy Belle	7 9	1 Feb.	20	230	15	7 15	11 31	2 0	12	41·50	Pale	V. Poor	12·00	12·00	24·00	
66	John Littleton's Mary..	5 2	3 Sept.	23	14	21	11 20	0 41	11 1	3	35·10	V. Pale	V. Poor	19·00	—	19·00	
67	John Littleton's Polly..	6 1	0 Sept.	18	19	18	0 18	15 36	15 1	7	25·14	V. Good	Fair	23·50	—	23·50	
68	G. B. Nelson's Spotty..	4 10	0 Sept.	1	36	23	15 24	11 48	10 1	1	44·45	Good	V. Poor	17·50	—	17·50	
72	Countess de la Warr's Buckhurst Peaceful	9 3	1 Sept.	11	26	22	15 21	15 44	14 2	2	21·11	V. Pale	V. Good	34·00	—	34·00	Prize of £3
76	J. L. Yllorson's Belvedere Nora	7 6	1 May	12	148	15	5 9	11 25	0 0	14	28·57	Pale	Good	14·00	10·80	24·80	
82	G. I. B. Chetwynd's Don Gordon	8 0	0 Aug.	22	46	24	2 22	7 46	9 1	10	28·65	V. Good	Good	26·00	·60	26·60	
83	B. de Bertodano's Cowbridge Dainty Dish	6 6	0 Mar.	12	209	12	13 12	3 25	0 1	1	23·18	Good	Good	17·25	12·00	29·25	
84	B. de Bertodano's La Mancha Sweet Nell	7 0	0 Mar.	29	192	14	2 12	15 27	1 1	3	22·78	Good	V. Good	19·00	12·00	31·00	

BUTTER TEST—COWS OTHER THAN SHORTHORNS OR JERSEYS—Continued.

No. in Catalogue	Name of Cow.	CHURNING—TIME AND TEMPERATURE				
		Time		Temperature		
		Churning began	Churning finished	Duration of Churning	Dairy Degrees	Cream and Churn Degrees
140	Muriel 11th	12 20	1 15	55	70	59
144	Rachael 2nd	12 45	1 22	37	70	60
149	Clarissa	12 3	12 33	30	70	60
153	Mona	12 26	1 0	34	70	61
154	Red Diamond	12 29	1 25	56	70	57
165	Dalfibble Daisy Bello ..	12 45	1 25	40	70	58
166	Mary	12 40	1 35	55	70	61
167	Polly	12 57	1 20	23	70	58
168	Spotty	1 11	1 45	34	70	59
172	Buckhurst Peaceful ..	12 53	1 15	22	70	57
176	Belvedere Nora	1 2	2 34	92	70	64
182	Don Gordonia	1 27	2 25	58	70	59
183	Cowbridge Dainty Dish ..	7 50	8 20	30	65	58
184	La Mancha Sweet Nell ..	7 47	8 23	36	65	59

BUTTER TESTS—SECOND CHURNING OF BUTTERMILKS.

No. in Catalogue	BREED	TIME			TEMPERATURE			Amount of Butter
		Churning began	Churning finished	Duration of Churning, Minutes	Dairy Degrees	Cream and Churn Degrees	Buttermilk, when churning finished Degrees	
32	Shorthorn..	p. m. 6 30	p. m. 7 15	45	71	53	62	lbs. ozs. 0 15
34	"	6 33	7 25	52	71	53	59	0 11
45	"	6 40	7 26	46	71	53	58	0 15½
47	"	6 38	7 40	62	71	53	61	none
49	"	7 30	8 2	32	72	53	57	0 6½
50	"	7 48	8 15	27	72	53	57	0 3½
53	"	7 44	8 24	40	72	53	59	0 7
54	"	a. m. 8 15	a. m. 9 20	65	66	53	58	none
55	"	8 33	9 40	67	66	53	60	none
57	"	8 45	9 50	65	66	53	59	none
83	Jersey	—	—	—	—	—	—	none
89	"	—	—	—	—	—	—	none
94	"	—	—	—	—	—	—	0 8½
149	Red Poll	a. m. 7 30	a. m. 8 2	32	65	53	58	0 7½
153	"	7 32	8 25	53	65	53	61	none
154	"	7 45	8 40	55	65	53	59	none
132	Kerry	7 53	8 20	27	66	53	57	0 3½

TABLE I.—NUMBER OF CATTLE TESTED SINCE 1897.

Breed	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908
Shorthorns	9	23	21	22	15	31	18	14	17	22	26	26
Lincoln Reds	—	—	—	—	—	—	—	—	—	—	7	9
Jerseys	14	17	15	29	25	30	20	12	18	13	13	16
Guernseys.....	3	5	4	7	8	1	5	3	3	2	2	2
Red Polls	7	4	9	7	2	6	5	4	11	12	11	3
Ayrshires	3	1	2	—	1	1	—	1	3	2	—	4
South Devons	—	—	—	—	—	—	2	2	3	5	—	—
Dutch.....	1	—	—	—	—	—	1	—	—	—	—	—
Kerries and Dexters ...	—	1	2	—	1	2	—	2	1	2	2	5
Welsh.....	—	1	1	1	—	—	—	—	—	—	—	—
Cross-breds	4	1	6	2	2	11	8	6	8	10	—	—
	41	53	60	68	54	82	59	44	64	68	61	65

TABLE II.—NUMBER OF CATTLE OF THE VARIOUS BREEDS TESTED SINCE 1895, WITH THEIR AVERAGE PERIOD OF LACTATION, WEIGHT OF BUTTER, BUTTER RATIOS, AND POINTS.

Year	No.	Breed	Average No. of Days in Milk	Average Weight of Butter	Average Butter Ratio	Average No. of Points
				lbs. ozs.	lbs.	
From 1895 to 1900	106	Shorthorns...	50 $\frac{1}{2}$	1 11	28·81	—
1901	15	"	44	2 0 $\frac{1}{2}$	26·69	33·69
1902	31	"	50	1 11 $\frac{1}{2}$	27·38	23·89
1903	18	"	41	1 11	38·59	28·44
1904	14	"	41 $\frac{1}{2}$	1 10	29·81	27·47
1905	17	"	53	1 13 $\frac{1}{2}$	27·05	31·25
1906	22	"	58	1 6 $\frac{3}{4}$	32·87	25·08
1907	26	"	62	1 11 $\frac{3}{4}$	29·23	30·24
1908	*35	"	49	1 11	29·39	28·05
" 1907	7	Lincoln Reds	57	1 13 $\frac{1}{2}$	28·31	31·91
" 1908	9	"	61	1 12	28·00	30·60
" 1895 to 1900	126	Jerseys	99	1 10 $\frac{1}{2}$	19·15	—
1901	25	"	141	1 9 $\frac{1}{2}$	17·80	34·44
1902	30	"	124	1 10	18·46	33·19
1903	20	"	141	1 11	18·12	36·13
1904	12	"	117	1 13 $\frac{1}{2}$	19·62	36·79
1905	18	"	134	1 10 $\frac{3}{4}$	19·48	35·51
1906	13	"	119	1 10 $\frac{1}{4}$	20·89	33·49
1907	13	"	111	1 11	19·71	34·49
1908	16	"	115	1 7 $\frac{1}{4}$	22·35	30·00
" 1895 to 1900	23	Guernseys	71 $\frac{3}{4}$	1 9 $\frac{1}{2}$	21·86	—
1901	8	"	81	1 8 $\frac{3}{4}$	21·43	29·51
1902	1	"	17	1 3 $\frac{3}{4}$	21·46	19·75
1903	5	"	52	1 1	27·77	18·93
1904	3	"	98 $\frac{1}{2}$	1 10	20·65	31·91
1905	3	"	165 $\frac{1}{2}$	1 6 $\frac{3}{4}$	19·66	31·78
1906	2	"	138	1 3 $\frac{1}{4}$	27·00	28·45
1907	2	"	82	1 12 $\frac{1}{2}$	18·90	33·48
1908	2	"	142	1 13 $\frac{1}{2}$	19·47	37·90
" 1895 to 1900	30	Red Polls	60 $\frac{1}{2}$	1 4 $\frac{3}{4}$	30·29	—
1901	2	"	80	1 8 $\frac{3}{4}$	25·50	28·77
1902	6	"	83	1 6 $\frac{3}{8}$	26·84	26·92
1903	5	"	124	1 0	39·60	21·39
1904	4	"	115 $\frac{1}{2}$	1 5 $\frac{1}{2}$	30·34	29·06
1905	11	"	74 $\frac{1}{4}$	1 3 $\frac{1}{2}$	28·78	22·76
1906	12	"	76	0 15	39·15	18·81
1907	11	"	99	1 2 $\frac{1}{4}$	33·21	23·96
1908	3	"	92	1 1	35·00	22·16
" 1896 to 1900	8	Ayrshires	52	1 12 $\frac{1}{4}$	26·35	—
1901	1	"	125	1 7 $\frac{1}{2}$	27·65	32·10
1902	1	"	33	1 3 $\frac{1}{2}$	18·00	19·50
1903	0	"	—	—	—	—
1904	1	"	116	0 12 $\frac{1}{2}$	35·20	20·10
1905	3	"	77	1 2 $\frac{3}{4}$	28·07	22·88
1906	2	"	23	1 11 $\frac{1}{4}$	25·51	27·75
1907	—	"	—	—	—	—
1908	4	"	75	1 2	35·19	21·00
" 1896 to 1900	3	Dexters and Kerries	117	0 14 $\frac{3}{8}$	40·80	—
1901	1	"	83	1 6 $\frac{1}{4}$	21·17	26·55
1902	2	"	46	1 7 $\frac{3}{8}$	21·28	23·49
1903	0	"	—	—	—	—
1904	2	"	72	0 14 $\frac{3}{8}$	21·31	18·45
1905	1	"	149	1 1 $\frac{1}{4}$	23·47	23·15
1906	2	"	33	1 13	22·4	29·10
1907	2	"	65	1 11 $\frac{1}{2}$	21·06	29·7
1908	5	"	124	1 6	24·47	29·13

TABLE III.—AVERAGE YIELD OF BUTTER OF THE DIFFERENT BREEDS AT DIFFERENT PERIODS.

Year	Breed	No. of Cows	Days in Milk, 50	No. of Cows	Days in Milk, 100	No. of Cows	Days in Milk, 135	No. of Cows	Days in Milk, 190
			lbs. ozs.		lbs. ozs.		lbs. ozs.		lbs. ozs.
1895 to									
1900	Shorthorns	19	1 12 $\frac{1}{2}$	6	1 7 $\frac{1}{2}$	2	1 4 $\frac{3}{8}$	8	1 1 $\frac{1}{2}$
1901	"	2	1 8	—	—	1	2 6	—	—
1902	"	6	1 10 $\frac{1}{2}$	—	—	1	1 11	—	—
1903	"	3	1 7	—	—	1	1 6 $\frac{1}{4}$	—	—
1904	"	3	1 10 $\frac{1}{3}$	1	1 14 $\frac{1}{2}$	—	—	—	—
1905	"	2	1 1	1	2 0 $\frac{3}{8}$	2	1 7 $\frac{3}{8}$	—	—
1906	"	11	1 8 $\frac{1}{2}$	3	1 3 $\frac{1}{2}$	—	—	—	—
1907	"	11	1 9 $\frac{1}{4}$	2	1 9 $\frac{3}{4}$	1	0 15 $\frac{3}{4}$	—	—
1908	"	11	1 11 $\frac{1}{4}$	—	—	2	1 12	—	—
1907	Lincoln Reds	3	1 12	1	1 11	—	—	—	—
1895 to									
1900	Jerseys	23	1 10 $\frac{1}{4}$	15	1 8 $\frac{1}{8}$	11	1 8 $\frac{1}{8}$	31	1 10 $\frac{1}{4}$
1901	"	1	1 12	8	1 7 $\frac{1}{2}$	6	1 9	12	1 10 $\frac{1}{4}$
1902	"	4	1 9 $\frac{3}{16}$	3	1 8 $\frac{3}{8}$	2	1 14	9	1 11
1903	"	4	1 9 $\frac{1}{16}$	5	1 15	9	1 9 $\frac{3}{8}$	2	1 9 $\frac{3}{4}$
1904	"	2	1 10 $\frac{1}{4}$	3	2 2 $\frac{1}{2}$	4	2 0 $\frac{1}{16}$	1	1 13 $\frac{1}{4}$
1905	"	3	1 8 $\frac{1}{2}$	4	1 15 $\frac{1}{4}$	8	1 9 $\frac{1}{4}$	2	1 8 $\frac{1}{2}$
1906	"	5	1 10 $\frac{1}{4}$	3	1 3 $\frac{1}{2}$	4	1 15 $\frac{1}{2}$	1	1 5 $\frac{1}{2}$
1907	"	6	1 13 $\frac{1}{4}$	2	1 7 $\frac{1}{8}$	3	1 13	1	1 4 $\frac{1}{2}$
1908	"	4	1 14 $\frac{1}{4}$	3	1 10	4	1 1	2	1 2
1895 to									
1900	Guernseys	3	1 7 $\frac{1}{4}$	4	1 7 $\frac{1}{2}$	3	1 4 $\frac{5}{8}$	1	1 8
1901	"	1	1 15 $\frac{1}{4}$	2	1 5 $\frac{3}{4}$	—	—	2	1 8 $\frac{5}{8}$
1902	"	—	—	—	—	—	—	—	—
1903	"	2	0 15 $\frac{1}{4}$	—	—	—	—	—	—
1904	"	2	1 6 $\frac{3}{4}$	—	—	1	2 0 $\frac{1}{8}$	—	—
1905	"	1	1 10 $\frac{1}{2}$	—	—	1	1 12 $\frac{1}{4}$	1	0 13 $\frac{1}{2}$
1906	"	—	—	1	1 1	1	1 5 $\frac{1}{2}$	—	—
1907	"	—	—	—	—	—	—	1	1 14
1908	"	1	1 13	—	—	—	—	1	1 14
1895 to									
1900	Red Polls	10	1 4 $\frac{1}{2}$	2	1 8	2	0 12 $\frac{3}{4}$	1	0 11
1901	"	—	—	2	1 8 $\frac{3}{8}$	—	—	1	—
1902	"	—	—	3	1 8	—	—	—	1 2 $\frac{1}{4}$
1903	"	1	0 13 $\frac{3}{4}$	1	1 1 $\frac{1}{4}$	—	—	1	0 13
1904	"	1	1 13	2	1 1	1	1 7 $\frac{1}{4}$	—	—
1905	"	3	1 1	2	1 5	—	—	1	0 12
1906	"	7	1 0	—	—	2	0 14 $\frac{1}{2}$	—	—
1907	"	5	1 4	—	—	4	1 1 $\frac{1}{4}$	—	—
1908	"	1	1 2 $\frac{3}{4}$	—	—	—	—	1	1 1
1908	Ayrshires	—	—	—	—	—	—	1	0 12
1908	Kerries & Dexters	—	—	—	—	1	0 14	2	1 2

TABLE IV.—COMPARISONS OF CHURNINGS WITH ANALYSES.
SHORTHORNS.

No. in Catalogue	Weight of Butter Churned		Total Fat shown by Chemical Analysis		No. in Catalogue	Weight of Butter Churned		Total Fat shown by Chemical Analysis	
	lbs.	ozs.	lbs.	ozs.		lbs.	ozs.	lbs.	ozs.
4	1	15	2	0	39	2	4	2	0
5	1	5 $\frac{1}{4}$	1	4	40	1	9	2	4
7	1	13 $\frac{3}{4}$	2	0 $\frac{1}{2}$	45	1	0	2	1
8	2	0	2	6 $\frac{1}{2}$	46	1	14	2	1
13	1	10 $\frac{1}{2}$	1	10 $\frac{1}{2}$	47	1	1 $\frac{3}{4}$	1	14 $\frac{1}{2}$
14	2	4	2	4	48	2	6 $\frac{3}{4}$	2	3 $\frac{1}{2}$
16	1	8	1	11 $\frac{3}{4}$	49	1	1 $\frac{1}{2}$	1	7
18	1	13 $\frac{1}{4}$	2	1	50	1	5 $\frac{1}{2}$	1	8
20	2	0 $\frac{1}{2}$	2	0 $\frac{1}{2}$	51	1	12 $\frac{3}{4}$	1	11 $\frac{3}{4}$
21	2	6	2	3 $\frac{1}{2}$	52	1	9 $\frac{1}{4}$	1	8 $\frac{1}{4}$
23	1	7 $\frac{1}{2}$	1	6	53	2	4 $\frac{1}{4}$	2	6 $\frac{3}{4}$
29	1	12	2	0	54	2	0	1	13 $\frac{1}{2}$
30	0	12 $\frac{1}{4}$	0	11 $\frac{1}{2}$	55	2	3	2	0 $\frac{3}{4}$
32	1	7 $\frac{3}{4}$	2	2 $\frac{1}{2}$	56	1	11	1	11 $\frac{1}{4}$
34	1	7 $\frac{1}{4}$	2	7	57	1	7	1	8
35	2	10 $\frac{1}{2}$	2	8 $\frac{1}{2}$	58	1	8	1	5
37	2	0	1	14 $\frac{1}{4}$	72	1	0	1	2 $\frac{1}{2}$
38	1	1	1	15		59	8 $\frac{1}{2}$	65	5 $\frac{1}{2}$

9 Lincoln Reds (included in the above), Nos. 50-58 (inclusive) :

Total amount of Butter Churned 15lbs. 12 $\frac{3}{4}$ oz.

" " of Butterfat by analysis..... 15lbs. 9 oz.

JERSEYS.

77	1	12 $\frac{1}{2}$	1	9 $\frac{3}{4}$	90	1	14 $\frac{1}{2}$	1	12
80	1	9	1	8 $\frac{1}{2}$	91	1	5 $\frac{1}{4}$	1	5 $\frac{1}{2}$
82	1	15 $\frac{1}{2}$	1	13	92	1	2 $\frac{3}{4}$	1	3 $\frac{3}{4}$
83	1	5 $\frac{1}{2}$	1	9	93	0	10 $\frac{1}{4}$	0	11 $\frac{3}{4}$
86	2	3 $\frac{1}{2}$	2	0	94	1	1 $\frac{1}{2}$	1	1
87	1	14 $\frac{1}{2}$	1	11	95	1	3	1	4 $\frac{3}{4}$
88	1	12 $\frac{3}{4}$	1	9 $\frac{1}{4}$	105	0	12 $\frac{1}{4}$	—	—
89	1	8 $\frac{1}{4}$	1	12 $\frac{3}{4}$	131	1	1 $\frac{1}{4}$	—	—
						23	4		

GUERNSEYS.

140	1	14	1	13 $\frac{1}{4}$	144	1	13	1	11
						3	11	3	8 $\frac{1}{4}$

RED POLLS.

149	1	1	1	7 $\frac{1}{4}$	154	0	15 $\frac{3}{4}$	1	3 $\frac{1}{2}$
153	1	2 $\frac{3}{4}$	1	6		3	3 $\frac{1}{2}$	4	1

AYRSHIRES.

165	0	12	0	14	167	1	7 $\frac{1}{2}$	1	6
166	1	3	1	5	168	1	1 $\frac{1}{4}$	1	11 $\frac{1}{2}$
						4	8	5	4 $\frac{1}{2}$

KERRIES AND DEXTERS.

172	2	2	2	2	183	1	1 $\frac{1}{4}$	1	2
176	0	14	0	15	184	1	3	1	3
182	1	10	1	11 $\frac{1}{2}$		6	14 $\frac{1}{4}$	7	1 $\frac{1}{2}$

TABLE V.—AVERAGE DIFFERENCES BETWEEN CHURNINGS AND CHEMICAL ANALYSES FROM 1898 TO 1908 INCLUSIVE.

Year	Breed	Churn	Analysis
		Lbs. Butter	Lbs. Fat
1898	Shorthorns	38.92	36.82
1899	"	34.34	32.46
1900	"	35.55	37.87
1901	"	29.05	27.80
1902	"	53.48	55.91
1903	"	30.72	35.92
1904	"	22.98	26.59
1905	"	30.89	30.58
1906	"	31.38	33.59
1907	"	45.14	47.79
1908	"	43.74	49.78
1907	Lincoln Red Shorthorns	12.94	12.31
1908	" " "	15.79	15.56
1898	Jerseys	29.15	27.26
1899	"	23.61	22.54
1900	"	39.75	39.32
1901	"	33.19	31.82
1902	"	43.61	41.03
1903	"	27.04	26.41
1904	"	22.22	22.06
1905	"	24.53	22.44
1906	"	19.56	18.71
1907	"	22.64	—
1908	"	22.25	—
1898	Guernseys	8.07	8.25
1899	"	5.90	5.53
1900	"	10.84	11.10
1901	"	12.46	11.59
1902	"	1.23	1.34
1903	"	5.34	6.47
1904	"	4.89	4.94
1905	"	3.42	3.42
1906	"	2.41	1.82
1907	"	3.54	3.22
1908	"	3.69	3.52

TABLE V.—AVERAGE DIFFERENCES BETWEEN CHURNINGS AND CHEMICAL ANALYSIS FROM 1898 TO 1908 INCLUSIVE—*continued*.

Year	Breed	Churn	Analysis
		Lbs. Butter	Lbs. Butter
1898	Red Polls... ..	5.01	5.56
1899	"	8.48	8.33
1900	"	8.98	9.81
1901	"	3.07	2.88
1902	"	8.36	8.00
1903	"	5.01	6.95
1904	"	5.39	6.00
1905	"	13.12	14.53
1906	"	11.39	14.50
1907	"	12.53	16.08
1908	"	3.21	4.06
1907	Kerries	3.40	3.19
1908	Kerries and Dexters	6.89	7.09
1908	Ayrshires... ..	4.50	5.28

THE POULTRY SECTION.

By L. C. VERREY, The Warren, Oxshott, Surrey.

The thirty-third Dairy Show held on October the 6th to 9th will long be remembered by all as the "hottest" known; the hottest not only respecting the competition and quality of the stock, but more especially as to the meteorological conditions that prevailed throughout the four days of the Show, for with summerlike weather the atmosphere, especially in the galleries, was at times almost tropical. In fact, the heat was so great that it was found necessary to curtail the display of dead poultry by 24 hours; therefore, they remained on view only two, instead of three, days.

As in former years, our section commenced with the table poultry. The class for a couple of Dorking cockerels was not numerically strong, but the quality was excellent, the winning pair being remarkably fine in size and texture of flesh. The pullet class was small. It would seem as though the cultivation of this fine old English breed for utility purposes was lessening, and that preference is being given to cross-bred birds, as the entries in the classes for these were double those of the pure breeds. The first prize pair of cross-bred cockerels scaled no less than 28 lbs., and were sold at the auction for 65s. The feature of this department was the special class confined to farmers and cottagers, being *bona fide* rearers of chickens fed under natural conditions and not crammed, of which there were 49 entries, many of the exhibits being of exceptional merit. The result of this experimental class has proved highly satisfactory, and should encourage the Committee to extend the classification another year.

The live poultry started the catalogue with three classes of breeding pens, each consisting of a cock and three hens, so that 136 birds were on view. In former years these quartettes have been shown in wooden houses, which, though elegant in appearance, did not enable the occupants being seen to advantage; therefore, this time the experiment was tried of having specially-constructed wire pens, each 4ft. 6in. in length. In these the birds looked very nice, and they could be easily and thoroughly inspected. Judging from the congratulations and satisfaction expressed, the innovation appears to have been much appreciated by the judges, exhibitors, and visitors. An exceedingly good pen of light Brahmas wrested the Association's silver medal from its 33 opponents.

Dorkings were rather more numerous than last year, but the entries show a decided falling-off to those of years ago. Is it that Dorkings, like some other good old breeds, are being displaced in public estimation by those of more modern introduction? Black Langshans always make a good display at the Dairy Show, but the Blues, Whites, and Croads were most disappointing, only 25 birds being entered in the four classes. Brahmas were about on a par with

former years, the silver medal being awarded to a light cockerel, with which it was difficult to find the least fault, his shape, type, and colour being perfect. He deservedly took the Champion Cup for the best feathered-legged bird in the Show. The Cochins classes were not so well filled as could have been desired, and it is to be regretted that both the classes for Blacks had to be cancelled for lack of entries. The Silver Medal for the best Cochin went to the 1st prize Buff cockerel, a very sound-coloured and well-developed fellow.

The competition in the Minorca classes was very strong, there being no less than 25 cockerels and 27 pullets, the winner in the former gaining the silver medal. It is pleasing to note that Houdans still continue to hold their own, many very typical specimens of both sexes being on view, the medal-winning cockerel being a real beauty. Faverolles also appear to be a favourite breed, judging by the two well-filled classes. Campines, Hamburgs, and modern Game were deficient in numbers, and several classes of the latter had to be cancelled in consequence of insufficient entries. On the other hand, Old English Game made a very interesting and meritorious display, possibly the best ever seen at "The Dairy Show." An average of a fraction over 17 birds per class must be considered entirely satisfactory, and the quality was "all there," the brown-red pullet that captured the medal being exceptionally good. Black Sumatra Game, Malays, and Indian Game call for no special comment.

Andalusians were not particularly strong in numbers, but were good in quality, both the winners being typical representatives of the breed, the pullet which gained the Medal being beautifully laced all through. Leghorns, as usual, made well-filled classes in all varieties except those for Whites, in which there was a sad falling off, only 8 cockerels and 14 pullets being penned, this being the smallest number of this once celebrated variety seen at the Dairy Show since 1883. The newly manufactured "Blues" came up in full force, there being no less than 18 cockerels and 19 pullets. Despite the furore that is being made about this coloured variety of the Leghorn family, I opine that it will be some considerable time before the "true blue" is perfected.

Barred Plymouth Rocks made two excellent classes, the other colours being only moderately represented. Wyandottes enjoy an ever-increasing popularity, and on the present occasion constituted a small show of themselves, there being no less than 320 exhibits, 55 of which were black pullets, truly a wonderful class for this comparatively new variety. The medal for the best Wyandotte went to the winning gold-laced cockerel.

Another current favourite—the Orpingtons—even exceeded the Wyandottes in numbers, as 341 birds were entered. Of the primary colours there were 63 Blacks, 89 Whites, and 127 Buffs, of which 75 were pullets, which formed the largest class in

the Show. The 1st prize Black cockerel beat his 340 opponents for the medal.

The Sussex fowls well maintained their Dairy reputation both for numbers and also quality, the speckled pullets being very good. Undoubtedly this breed has a bright future before it, and ere long it will not be surprising if it rivals some of the more favoured breeds of to-day. Yokohamas were decidedly good, the cockerels showing to great advantage in the special new large pens, which allowed of the full length of tail being fully displayed. The one class for any other variety contained two novelties in the shape of a Rose-comb Plymouth Rock and a Blue Wyandotte. It is a noticeable fact that not a single Black Spanish was exhibited, whilst at one time the variety was a warm favourite, and made a good display at the Agricultural Hall.

The 31 selling classes contained no less than 498 entries, a fact which clearly demonstrates that breeders fully realise the advantage of these classes for the disposal of their surplus stock.

The Bantams formed a remarkably fine collection, the Games being especially good, and amongst the Black-red cockerels was found the winner of the Lord Mayor's Cup for the best clean-legged fowl in the Show. Certainly a most creditable performance for a pigmy to beat all the larger races.

Waterfowl made an average display for numbers, whilst the quality was excellent. A novelty was found in this section in the form of Buff Orpington ducks, the two classes being well supported. Judging from appearance, they seem to be a very useful sort of bird that is likely to have a bright future before it. The geese and turkeys were very good, many very meritorious specimens of both being on view.

It is pleasing to note that the Poultry Section of the great Dairy Show continues to thrive and prosper, and that this department, with 3,280 entries, proved to be the second largest on record, this large number only having been once beaten, and that was in 1906, when the total was 3,335.

THE PIGEON SECTION.

By JOHN H. ROSS.

This section of the Dairy Show still maintains its popularity with exhibitors of pigeons. It being the first of the great events of the season, the majority of young birds are making their first appearance in the show pen, and the owners anxiously await the awards, to compare the merits of their exhibits with those of brother fanciers. The entries, numbering 2,566, were not quite so large as in 1907, when 2,665 pens were entered.

Fantails were a very fine display of 108 pens, although I have seen better classes in previous years.

Pouters were well represented with 50 entries in the four classes provided, and the winning young black cock (S. Robson) is a very typical specimen of the variety.

Pigmy Pouters mustered 66, the young classes being, as usual, the best supported, the young black-pied cock (W. Hammond) being about the pick of the basket.

Norwich Croppers, 34, were a dozen in advance of 1907, and were shown in first-class condition.

Carriers, 77, I am sorry to report were not as good as in previous years, and were 26 down in numbers. The "any other colour" classes were cancelled for want of support.

Barbs had 44 entries in the four classes, the young birds mustering 19.

Dragoons, although as popular as ever, were not so numerous as on previous occasions, the classes for 1908 birds showing the greatest falling-off. The best-filled classes were the young Blues and Chequers, both cocks and hens. The Chequers accounted for both the cock and the hen Challenge Cups, and were both won by Messrs. G. and J. Smith. The cock also secured the Fulton Challenge Trophy, competed for by Dragoons, Antwerps, Show and Working Homers. Grizzles appear to be again coming into favour, the entries being more numerous than has been the case for some years past.

Short-faced Tumblers were not so well supported as in 1907, the reason being given that the birds were this year very backward in the moult, and also that one of the largest exhibitors being appointed as judge.

Long-faced Tumblers, although provided with an extensive classification of 25 classes, showed a falling-off of 43 entries compared with 1907. The Silver Medal of the Association for the best Long-faced Tumbler bred in 1908 went to a very bold-headed specimen of a Black Baldhead (F. May). The popular Black Sells provided the largest class, that for young ones numbering 24 entries.

The winner in the class for Muffed-legged was a 1908 Blue-barred, a bird of exceptional merit (Rob Smith).

Both English and Foreign Owls came up well, and the quality of the stock was very good. The Medal for the best young Owl was secured by Mr. Gatty's Silver, a very typical specimen.

Turbits showed an increase of 33 entries compared with 1907, and, in the opinion of the judge, were well up to the high standard of the Dairy Show. The quality of the young birds was remarkably good, especially so in the Blues and Reds. The Lord Mayor's Cup was awarded to an exhibit in this variety, competing against Short-faced Tumblers, Barbs, English and Foreign Owls. Mr. H. P. Scatliff secured the coveted award, and also the Association Silver Medal, with a lovely Blue.

Archangels were well supported with 68 entries in the four classes provided.

Jacobins were about an average entry of 80, representing all the leading breeders, and the competition throughout was very keen, especially in young birds. The class for young Reds or Yellows contained 25 entries, and the winner in this class (Mr. F. Webster) also secured the Silver Medal of the Association for the best young Jacobin.

Oriental Frills, with three additional classes, brought together 176 pens of these interesting birds. As usual, the Blondinette classes were the best supported. Mr. W. Turton won the Cup given by Spratts Limited with a very typical Dun-laced Blondinette, extra good in head points and lacing.

Magpies numbered 215, being 20 less than last year; the quality throughout was very high. The Yellows made a fine display, and probably better than has yet been seen at the Dairy Show. The Yellow cock (Bracey and Cooke) secured not only 1st in its class, but also the Gold Medal of the Association, competing against Jacobins, Fantails, Archangels, Nuns, and Long-faced Tumblers, and the Silver Association Medal for the best Magpie.

Scanderoon are increasing in popularity, and had 35 entries in the two classes.

Antwerps were very disappointing, three classes out of eight being cancelled for want of support, and it behoves fanciers of this old variety to bestir themselves, otherwise the classification will have to be curtailed.

Show Homers had a decreased entry of 52 pens. The adult classes contained all the best birds out, but I hardly think the young classes were up to the usual Dairy Show standard. The Silver Challenge Trophy for the best Show Homer of any age was won by the well-known Mealy, owned by Mr. W. Austin.

The classes for Working Homers maintain their popularity, 145 birds facing the judge. The two classes for birds bred in 1908

and flown at least 100 miles brought together the splendid total of 63 birds.

Cumulets were included in the schedule for the first time, and brought together 56 entries in the five classes provided.

The Selling Classes, as usual, were well supported, and many sales effected at the auction and through the sales office.

Taking the Show on the whole, it was a good one, and fully rivalled its predecessors.

SEPARABILITY AND CHURNABILITY OF MILK OBTAINED AT THE LONDON DAIRY SHOW MILKING TRIALS, 1908.

By JOHN W. TAYLOR, Agricultural Chemist, University College,
Reading.

As far as I am aware, this is the first occasion on which the separated milks and butter-milks obtained at any butter tests have been tested for fat content.

The credit of the innovation is due to the judge of the butter tests for 1908 (Mr. R. H. Evans, B.Sc.).

Owing to pressure of work connected with the milking trials, the Chemist to the British Dairy Farmers' Association (Mr. F. J. Lloyd, F.I.C.) was unable to undertake the analyses, and I was appointed.

Before giving the figures obtained, it may be as well to outline the objects of the work and the methods employed.

OBJECTS.

- (1) To test the separability of the fat in the milk of each cow taking part in the butter tests, and to find the actual loss of fat.
- (2) To test the churnability of the creams removed by the separators, and to find the actual loss of fat.
- (3) To obtain the percentage of fat which is available for butter-making.
- (4) To find the amount of butter obtained by re-churning certain butter-milks, also the fat left in the second butter-milk.

METHODS.

- (1) Both separated and butter milks were weighed soon after production.
- (2) Samples of about 6 ozs. were taken after weighing and careful mixing.
- (3) The percentage of fat was determined by "Gerber," using the "Sal" method, as supplied by the Dairy Supply Co., Ltd.

Tables I., II., III., and IV., giving full details of the work, are appended.

TABLE I. WEIGHTS AND ANALYSES OF

No. of Cows	MORNING'S MILK				EVENING'S	
	Weight of Milk	Weight of separated Milk and Washing Water	Per cent. of Fat	Lbs. of Fat in separated Milk	Weight of Milk	Weight of separated Milk and Washing Water
SHORT						
1	29.44	21.5	.05	.011	29.12	24.0
5	19.31	15.5	.05	.008	18.69	16.0
7	27.44	27.5	.10	.028	27.62	26.5
8	31.69	27.75	.05	.014	31.00	24.5
13	24.00	19.75	.10	.020	22.18	19.0
14	27.69	26.25	.075	.020	30.18	25.25
16	23.12	18.50	.05	.009	25.12	23.75
18	25.12	20.50	.05	.010	25.94	21.75
20	31.18	27.0	.05	.014	27.62	23.0
21	30.94	28.5	.05	.014	30.81	23.75
23	32.50	27.5	.025	.007	32.00	26.75
29	20.00	16.5	.05	.008	20.00	20.0
30	17.50	16.75	.075	.013	19.62	18.0
32	20.00	26.0	.10	.026	28.00	24.0
34	28.12	22.0	.05	.011	26.81	22.0
35	29.18	26.5	.10	.027	22.62	21.0
37	22.31	18.0	.05	.009	23.44	19.0
38	25.44	20.75	.025	.005	22.18	22.75
39	35.81	27.0	.05	.014	25.12	20.5
40	25.94	20.0	.025	.005	22.69	19.0
45	19.44	20.0	.05	.010	19.12	17.0
46	29.44	22.5	.025	.006	30.00	24.5
47	21.44	17.75	.025	.004	23.94	20.5
48	25.69	25.0	.05	.012	25.00	21.0
49	17.12	15.25	.025	.004	18.94	16.5
50	26.50	27.25	.075	.020	22.69	18.5
51	20.31	20.75	.05	.010	21.00	21.5
52	23.18	18.75	.05	.009	22.00	22.25
53	24.62	26.25	.025	.007	21.69	18.25
54	29.31	28.25	.075	.021	26.31	20.50
55	31.31	23.50	.05	.012	32.18	26.25
56	24.31	18.75	.025	.005	28.81	24.00
57	25.00	24.25	.050	.012	25.44	20.50
58	18.12	15.00	.025	.004	19.50	20.25
72	13.31	11.00	.050	.006	13.62	11.75
Totals.	887.83	768.00	..	415	861.00	7.53 75
JER						
77	17.25	14.50	.075	.011	15.37	15.25
80	18.25	16.75	.01	.002	19.25	20.50
82	22.62	18.25	.05	.009	22.62	20.25
83	20.25	17.75	.05	.009	18.00	24.25
86	23.00	21.25	.125	.027	20.87	23.25

SEPARATED MILKS AND BUTTER-MILKS.

MILK		BUTTER-MILK FROM MORNING'S AND EVENING'S CREAM.			Total Fat lost (in lbs.)	No. of Cows
Per cent. of Fat	Lbs. of Fat in Separated Milk	Weight of Butter-milk	Per cent. of Fat	Lbs. of Fat in Butter-milk		
HORNS.						
·05	·012	30·50	·90	·275	·298	4
·05	·008	23·25	·25	·058	·074	5
·10	·027	19·00	2·05	·390	·445	7
·075	·018	27·25	2·50	·681	·713	8
·05	·010	25·0	1·00	·250	·280	13
·075	·019	23·75	1·60	·380	·419	14
·075	·018	18·00	2·80	·504	·531	16
·05	·011	24·00	2·00	·480	·501	18
·025	·006	24·50	1·20	·294	·314	20
·025	·006	21·75	·35	·076	·096	21
·025	·007	29·75	·25	·074	·088	23
·05	·010	15·50	2·70	·419	·437	29
·05	·009	15·25	·30	·046	·068	30
·10	·024	18·00	5·2	·936	·986	32
·05	·011	16·00	7·40	1·184	1·206	34
·075	·016	17·75	1·40	·249	·292	35
·025	·005	21·00	·90	·189	·203	37
·025	·006	32·00	2·70	·864	·875	38
·05	·010	25·25	1·0	·253	·277	39
·025	·005	21·50	2·90	·624	·634	40
·025	·004	27·75	4·20	1·166	1·180	45
·025	·006	30·00	1·80	·540	·552	46
·025	·005	23·00	3·40	·782	·791	47
·025	·005	19·00	·50	·095	·112	48
·05	·013	14·50	3·00	·435	·452	49
·05	·009	19·00	1·70	·323	·352	50
·05	·011	19·75	·70	·138	·159	51
·075	·017	23·50	·20	·047	·073	52
·025	·005	16·75	2·30	·385	·397	53
·025	·005	18·50	·80	·148	·174	54
·025	·007	23·00	·70	·161	·180	55
·01	·002	25·0	1·10	·275	·282	56
·025	·005	18·25	1·20	·219	·236	57
·05	·010	14·00	·20	·028	·042	58
·05	·006	22·25	1·30	·289	·301	72
..	·348	763·25	..	13·257	14·020	
SEYS.						
·075	·011	20·75	·40	·083	·105	77
·05	·010	20·00	·55	·110	·122	80
·05	·010	20·50	·20	·041	·060	82
·025	·006	25·00	*1·00	·250	·265	83
·075	·017	18·00	·75	·135	·179	86

*=Second Butter-milks.

TABLE I. WEIGHTS AND ANALYSES OF

No. of Cows	MORNING'S MILK				EVENING'S	
	Weight of Milk	Weight of Separated Milk and Washing Water	Per cent. of Fat	Lbs. of Fat in Separated Milk	Weight of Milk	Weight of Separated Milk and Washing Water
JERSEYS						
87	16.62	14.75	.025	.004	19.62	19.50
88	12.50	13.25	.075	.010	11.50	13.50
89	18.37	16.25	.050	.008	19.50	21.75
90	22.25	22.00	.075	.017	20.37	22.50
91	16.50	14.50	.05	.007	15.75	16.00
92	11.50	11.00	.075	.008	11.50	12.75
93	8.75	10.50	.10	.010	10.25	11.00
94	13.00	11.75	.05	.006	14.12	14.00
95	17.12	16.75	.05	.008	19.75	20.50
105	10.87	11.50	.01	.001	11.50	11.75
131	10.62	10.50	.05	.005	9.62	10.50
Totals.	259.47	241.25	..	.142	259.59	277.25
GUERN						
140	15.44	17.75	.075	.013	14.31	13.75
144	21.18	21.25	.10	.021	20.94	17.50
Totals.	36.62	39.00	..	.034	35.25	31.25
RED						
149	21.44	16.25	.075	.012	19.31	19.25
153	17.94	19.75	.10	.020	16.50	14.50
154	18.69	15.25	.075	.014	18.94	17.50
Totals.	57.63	51.25	..	.046	54.75	51.25
AYR						
165	15.44	15.25	.20	.031	15.69	17.75
166	21.69	17.25	.025	.004	20.00	20.00
167	18.00	20.00	.025	.005	18.94	16.25
168	23.94	24.25	.075	.018	24.69	20.00
Totals.	79.07	76.75	..	.058	79.32	74.00
KERRIES AND						
172	22.94	17.25	.025	.004	21.94	20.25
176	15.31	12.00	.10	.012	9.69	7.25
182	24.12	18.00	.075	.014	22.44	18.00
183	12.81	10.00	.05	.005	12.18	10.50
184	14.12	16.50	.05	.008	12.94	11.50
Totals.	89.30	73.75	..	.043	79.19	67.50

SEPARATED MILKS AND BUTTER-MILKS—*continued.*

MILK		BUTTER-MILK FROM MORNING'S AND EVENING'S CREAM			Total Fat lost (in lbs.)	No. of Cows
Per cent. of Fat	Lbs. of Fat in Separated Milk	Weight of Butter Milk	Per cent. of Fat	Lbs. of Fat in Butter Milk		
—continued.						
·050	·010	20·00	·25	·050	·064	87
·075	·010	17·25	·075	·013	·033	88
·050	·011	25·00	*·40	·100	·119	89
·025	·006	25·00	·20	·050	·073	90
·025	·004	24·50	·60	·147	·158	91
·075	·010	20·25	·90	·182	·200	92
·05	·006	18·50	·60	·111	·127	93
·025	·004	16·00	*·40	·064	·074	94
·05	·010	19·00	·60	·114	·132	95
·05	·006	16·50	·10	·017	·024	105
·05	·005	17·50	·05	·009	·019	131
..	·136	323·75	..	1·476	1·754	
SEYS.						
·05	·007	21·00	·25	·052	·072	140
·05	·009	27·50	·30	·082	·113	144
..	·016	48·50	..	·135	·185	
POLL.						
·10	·019	18·75	2·90	·544	·575	149
·075	·011	18·25	1·90	·347	·378	153
·05	·009	22·50	2·00	·450	·473	154
..	·039	59·50	..	1·341	1·426	
SHIRES.						
·025	·004	17·0	1·20	·204	·239	165
·025	·005	21·75	1·60	·348	·357	166
·025	·004	21·25	·50	·106	·115	167
·05	·010	21·00	3·40	·714	·742	168
..	·023	81·00	..	1·372	1·453	
DEXTERS.						
·025	·005	17·00	1·70	·290	·299	172
·05	·004	16·0	1·0	·160	·176	176
·025	·005	23·75	1·60	·380	·399	182
·025	·003	15·50	·60	·093	·101	183
·075	·009	17·25	·90	·155	·172	184
..	·026	89·50	..	1·078	1·147	

*=Second Butter-milks.

TABLE 11. -SHOWING THE PERCENTAGE

No. of Cows	MORNING'S MILK			EVENING'S MILK		
	Weight of Milk	Per cent. of Fat	Weight of Fat	Weight of Milk	Per cent. of Fat	Weight of Fat
						SHORT
4	29.44	3.06	.90	29.12	3.66	1.07
5	19.31	2.93	.57	18.69	3.32	.62
7	27.44	3.54	.97	27.62	3.72	1.03
8	34.69	3.20	1.11	31.00	4.06	1.26
13	24.00	3.32	.80	22.18	3.97	.88
14	27.69	3.58	.99	30.18	4.11	1.24
16	23.12	3.51	.81	25.12	3.56	.89
18	25.12	3.64	.91	25.94	4.34	1.13
20	31.18	3.20	1.00	27.62	4.01	1.11
21	30.94	3.45	1.07	30.81	3.46	1.07
23	32.50	2.07	.67	32.00	2.07	.66
29	20.00	5.26	1.05	20.00	4.56	.91
30	17.50	1.57	.27	19.62	2.33	.46
32	29.00	3.58	1.03	28.00	4.15	1.16
34	28.12	4.39	1.23	26.81	4.43	1.19
35	29.18	5.26	1.53	22.62	4.51	1.02
37	22.31	3.88	.87	23.44	4.35	1.02
38	25.44	3.14	.80	22.18	4.10	.91
39	35.81	2.84	1.02	25.12	4.64	1.17
40	25.94	3.99	1.04	22.69	3.87	.88
45	19.44	4.95	.96	19.12	5.65	1.08
46	29.44	2.98	.88	30.00	3.85	1.16
47	21.44	3.95	.85	23.94	3.83	.92
48	28.69	4.37	1.25	25.00	4.13	1.03
49	17.12	3.81	.65	18.94	3.77	.71
50	26.50	3.00	.80	22.69	3.02	.69
51	20.31	3.48	.71	21.00	5.11	1.07
52	23.18	3.30	.76	22.00	3.24	.71
53	24.62	5.14	1.27	21.69	5.26	1.14
54	29.31	3.14	.92	26.31	3.68	.97
55	31.31	2.87	.90	32.18	3.49	1.12
56	24.31	2.49	.61	28.81	4.22	1.22
57	25.00	2.80	.70	25.44	3.19	.81
58	18.12	2.95	.54	19.50	4.16	.81
72	13.31	4.23	.56	13.62	4.35	.59
						JER
77	17.25	4.97	.86	15.37	5.08	.78
80	18.25	3.73	.68	19.25	4.41	.85
82	22.62	3.47	.78	22.62	4.53	1.02
83	20.25	4.03	.82	18.00	3.61	.65

OF FAT AVAILABLE FOR BUTTER.

Total Weight of Fat in Morning and Evening's Milk	Total Loss of Fat in Separating and Churning	Therefore Fat available for Butter	Equal to Per cent. of Fat available for Butter	Per cent. of Fat available for Butter after churning Butter-milk (See Table IV.)	No. of Cows
HORNS.					
1.97	.298	1.672	84.8	..	4
1.19	.074	1.116	93.8	..	5
2.00	.445	1.555	77.8	..	7
2.37	.713	1.657	69.9	..	8
1.68	.280	1.400	83.3	..	13
2.23	.419	1.811	81.2	..	14
1.70	.531	1.169	68.8	..	16
2.04	.501	1.539	75.4	..	18
2.11	.314	1.796	85.1	..	20
2.14	.096	2.044	95.5	..	21
1.33	.088	1.242	93.4	..	23
1.96	.437	1.523	77.7	..	29
.73	.068	.662	90.7	..	30
2.19	.986	1.204	55.0	88.4	32
2.42	1.206	1.214	50.2	83.8	34
2.55	.292	2.258	88.5	..	35
1.89	.203	1.687	89.3	..	37
1.71	.875	.835	48.8	..	38
2.19	.277	1.913	87.4	..	39
1.92	.634	1.286	67.0	..	40
2.04	1.180	.860	42.2	82.1	45
2.04	.552	1.488	72.9	..	46
1.77	.791	.979	55.2	55.3	47
2.28	.112	2.168	85.0	..	48
1.36	.452	.908	66.8	88.2	49
1.49	.352	1.138	76.4	..	50
1.78	.159	1.621	91.1	..	51
1.47	.073	1.397	95.0	..	52
2.41	.397	2.013	83.5	..	53
1.89	.174	1.716	90.8	..	54
2.02	.180	1.840	91.1	..	55
1.83	.282	1.548	84.6	..	56
1.51	.236	1.274	84.4	..	57
1.35	.042	1.308	96.9	..	58
1.15	.301	.849	73.8	..	72
			78.9	Average	
SEYS.					
1.64	.105	1.535	93.6	..	77
1.53	.122	1.408	92.0	..	80
1.80	.060	1.740	96.7	..	82
1.47	.265	1.205	82.0	..	83

TABLE II.—SHOWING THE PERCENTAGE

No. of Cows	MORNING'S MILK			EVENING'S MILK		
	Weight of Milk	Per cent. of Fat	Weight of Fat	Weight of Milk	Per cent. of Fat	Weight of Fat
JERSEYS						
86	23.00	4.46	1.03	20.87	5.34	1.11
87	16.62	3.47	.58	19.62	5.89	1.16
88	12.50	6.81	.85	11.50	6.60	.76
89	18.37	3.97	.73	19.50	5.55	1.08
90	22.25	3.62	.81	20.37	4.95	1.01
91	16.50	3.69	.61	15.75	4.70	.74
92	11.50	5.64	.65	11.50	5.01	.58
93	8.75	3.59	.31	10.25	3.97	.41
94	13.00	3.23	.42	14.12	4.54	.64
95	17.12	2.97	.51	19.75	4.57	.90
105	10.87	..	..	11.50	..	..
131	10.62	..	..	9.62	..	..
GUERN						
140	15.44	5.95	.92	14.31	5.89	.84
144	21.18	3.66	.78	20.94	4.07	.85
RED						
149	21.00	3.60	.76	19.31	3.68	.71
153	17.94	3.97	.71	16.50	4.00	.66
154	18.69	3.44	.64	18.94	3.50	.66
AYR						
165	15.44	2.19	.34	15.69	3.66	.57
166	21.69	2.89	.63	20.00	3.22	.64
167	18.00	3.91	.70	18.94	3.54	.67
168	23.94	2.95	.71	24.69	3.83	.95
KERRIES AND						
172	22.94	4.64	1.06	21.94	4.77	1.05
176	15.31	4.24	.65	9.69	3.00	.29
182	24.12	3.12	.75	22.44	4.63	1.04
183	12.81	4.23	.54	12.18	4.33	.53
184	14.12	4.63	.65	12.94	4.42	.57

OF FAT AVAILABLE FOR BUTTER—continued.

Total Weight of Fat in Morning and Evening's Milk	Total Loss of Fat in Separating and Churning	Therefore Fat available for Butter	Equal to Per cent. of Fat available for Butter	Per cent. of Fat available for Butter after churning Butter-milk (See Table IV.)	No. of Cows
—continued.					
2.14	.179	1.961	91.6	..	86
1.74	.064	1.676	96.3	..	87
1.61	.033	1.577	98.0	..	88
1.81	.119	1.691	93.4	..	89
1.82	.073	1.747	96.0	..	90
1.35	.158	1.192	88.3	..	91
1.23	.200	1.030	83.7	..	92
.72	.127	.593	82.4	..	93
1.06	.074	.986	93.0	..	94
1.41	.132	1.278	90.6	..	95
..	.024	..	..	..	105
..	.019	..	..	..	131
SEYS.			91.2	Average	
1.76	.072	1.688	95.9	..	140
1.63	.113	1.517	93.1	..	144
POLL.			94.5	Average	
1.47	.575	.895	60.9	88.8	149
1.37	.378	.992	72.4	..	153
1.30	.473	.827	63.6	..	154
SHIRES.			65.6	Average	
.91	.239	.671	73.7	..	165
1.27	.357	.913	71.9	..	166
1.37	.115	1.255	91.6	..	167
1.66	.742	.918	55.3	..	168
DENTERS.			73.1	Average	
2.11	.299	1.811	85.8		172
.94	.176	.764	81.3		176
1.79	.399	1.391	77.8	86.6	182
1.07	.101	.969	90.6	..	183
1.22	.172	1.048	85.9	..	184
			84.3	Average	

TABLE III.—LOSS OF FAT IN 100 LBS. OF MILK FROM VARIOUS BREEDS.

Breed	No. of Cows	Morning's Milk lbs. = approx. ozs.		Evening's Milk lbs. = approx. ozs.		Morning's and Evening's Cream lbs. = approx. ozs.	
Shorthorn	35	·047	$\frac{3}{4}$ oz.	·041	$\frac{3}{4}$ oz.	·76	12 oz.
Jersey	16	·055	1 „	·052	1 „	·28	$4\frac{3}{4}$ „
Guernsey	2	·093	$1\frac{1}{2}$ „	·045	$\frac{3}{4}$ „	·19	3 „
Red Poll	3	·080	$1\frac{1}{3}$ „	·071	1 „	1·19	1 lb. 3 oz.
Ayrshire	4	·073	$1\frac{1}{4}$ „	·029	$\frac{1}{2}$ „	·87	14 oz.
Kerry & Dexter	5	·052	1 „	·033	$\frac{1}{2}$ „	·64	$10\frac{1}{2}$ „

TABLE IV.—SHOWING BUTTER OBTAINED BY RE-CHURNING CERTAIN BUTTER-MILKS.

No. of Cows	Butter obtained at First Churning	Percentage and amount of Fat in First Butter-milk		Butter obtained at Second Churning	Percentage of Fat in Second Butter-milk
	lbs. ozs.	Per cent.	lbs. ozs.	lbs. ozs.	Per cent.
SHORTHORN.					
32	1 7 $\frac{3}{4}$	5·2	0 15	0 15	1·2
34	1 7 $\frac{1}{4}$	7·4	1 3	0 11	2·3
45	1 0	4·2	1 2 $\frac{3}{4}$	0 15 $\frac{1}{2}$	1·2
47	1 1 $\frac{3}{4}$	3·4	0 12 $\frac{1}{2}$	....	3·4
49	1 1 $\frac{3}{4}$	3·0	0 7	0 6 $\frac{1}{2}$	1·0
50	1 5 $\frac{1}{2}$	1·7	0 5 $\frac{1}{4}$	0 3 $\frac{1}{2}$	·8
53	2 4 $\frac{1}{4}$	2·3	0 6 $\frac{1}{4}$	0 7	·2
RED POLL.					
149	1 1	2·9	0 8 $\frac{1}{4}$	0 7 $\frac{3}{4}$	·7
153	1 2 $\frac{3}{4}$	1·9	0 5 $\frac{3}{4}$	....	1·8
154	0 15 $\frac{3}{4}$	2·0	0 7	....	2·0
KERRY AND DEXTER.					
182	1 10	1·6	0 6	0 3 $\frac{1}{2}$	1·0

CONCLUSIONS.

(1)—*Separability of Milks.*

All the milks were treated similarly as regards separating, temperature, speed, and adjustment of separator, but it will be noted, by comparing the weights of original milk with the separated milks, that very variable amounts of water have been used in cleansing the separators.

Table I. shows that the amount of fat lost in the separated milk is small, the greatest loss of fat, amounting to only half-an-ounce for a cow, or about 2 ozs. per 100 lbs. of milk, while the average loss was less than half this.

In this connection the good work done by the two Alpha Laval Separators must not be overlooked.

Table III. gives the average loss of fat occurring in different breeds, calculated from the totals given in Table I.

(2)—*Churnability of Cream.*

Table I. shows that even under expert management the loss of fat during churning can be very considerable. I leave the reader to imagine what might happen when the churnings are carried out by those lacking that knowledge which is imparted by any good dairy school.

The figures for the Shorthorns and Jerseys are the most reliable, as the number of samples in the other cases is small.

The results indicate that under show conditions the loss of fat may be considerable, and it would seem advisable to repeat the work at future Dairy and Agricultural Shows where butter tests are held in order to make sure of the point, and to determine, in part, what are the conditions which lead to such losses.

Cows are known to be nervous animals, and abnormal losses may be due to such show conditions as high feeding, excitement, and high temperature of the building.

It would be interesting to have a series of analyses of butter-milks obtained from individual cows of different breeds under ordinary dairying conditions.

The Secretary of the British Dairy Farmers' Association informs me that in the Jersey class the butter-milks of numbers 83, 89, and 94 were re-churned, numbers 83 and 89 yielded nothing, and number 94 yielding $8\frac{1}{2}$ ozs. It will thus be seen that even under show conditions Jerseys keep up their reputation as butter-making cows, since by reference to Tables I. and II. the loss of fat in churning will be seen to be comparatively small.

(3)—*Percentage of Fat available for Butter.*

Table II. gives the details by which the percentages of fat available for butter have been calculated.

These figures would have been more instructive had the butter obtained in the tests been analysed, as it could then have been calculated how much of this available fat was actually present in the butter.

By the average percentage of fat available, the breeds here examined can be placed in the following order as regards butter-making :—

(1) Guernsey	Average of 2 cows	..	94.5 per cent.
(2) Jersey	.. 16	..	91.2
(3) Kerry and Dexter	.. 5	..	84.3
(4) Shorthorn	.. 35	..	78.9
(5) Ayrshire	.. 4	..	73.1
(6) Red Poll	.. 3	..	65.6

In the Shorthorn class the average is materially reduced by Nos. 32, 34, 38, 45, 47. If these are left out, the figure rises to 83.4 per cent.; and if the amounts obtained by churning the butter-milks of these are taken, the average is about 82.9 per cent.

Show conditions have evidently affected all the breeds, since even the Guernseys do not quite give up the amount of fat which is usually expected in modern dairying, but the yield of 95-97 per cent. obtained in factory work is, of course, from mixed milk, not that of individual cows; also, the cream is churned in a riper condition.

The low percentage of available fat in Ayrshire and Red Poll is interesting, and would be more so if there were more cows in the classes, so that fairer averages could be obtained.

It must not be forgotten that in every case a small part of the fat said to be available for butter has been removed in the sample taken by Mr. Lloyd, but I have thought it best to include this, as I have not given any figures relating to the percentage of fat in the butter.

(4)—*Effect of Re-churning Butter-milks.*

Table IV. gives the amount of butter obtained by re-churning certain butter-milks, also the percentage of fat present in the second butter-milks.

It will be seen that in many cases re-churning is effective, numbers 47, 153, and 154 being exceptions.

If the foregoing pages do nothing else than call attention to the necessity of further work on the subject, this beginning will not be wasted.

SUGGESTIONS.

I venture to add the following in the hope that the points touched upon will be dealt with by men of greater experience than myself, since it is only by combined effort that progress can be made.

(1) *The water* used in washing out the separators should be either in proportion (say 20 per cent.) to the original milk or of fixed amount, since if varying quantities are used the cream will in some cases be very thin, thus leading to loss of fat in churning.

(2) *Breaking water* should be similarly measured, as by reference to Table I. it will be seen that some of the butter-milks are very much diluted, thus leading to loss of fat.

(3) *The churns* might be rotated by a common shaft, with gearing for stopping any particular churn.

This would partly eliminate the personal equation, which undoubtedly leads to differences in butter yield, as illustrated by the varying amounts of butter obtained from the same weight of mixed cream by the competitors in the butter-making competitions.

(4) *All the creams* should be brought to and kept at an equal temperature after separating, otherwise large amounts of cream will remain warm longer than small ones, and will therefore become ripier, and yield a higher proportion of butter.

The temperature used should be sufficiently low (say 56° F.) to insure the maximum yield of butter.

It might also be interesting to take the acidity of the cream after separating and just previous to churning.

(5) *All the butters*, including those obtained by re-churning, should be submitted to (complete) chemical analysis, as from the calculations I have been able to make from the foregoing tables the percentage of matter other than fat varies from 9 to 22.

These suggestions may be considered by many as an attempt to carry the butter tests too far, but, after all, such tests are undertaken mainly for the sake of information, and a trial of the foregoing might be instructive, and could, with proper organisation, be carried out at a comparatively small additional cost.

APPLICATIONS FOR PATENTS FOR DAIRY APPLIANCES, &c.

From Jan. 1st to Dec. 31st, 1908.

No. of Application.	Name of Applicant.	Subject of Invention.
420	Thompson, W. P. (<i>Wiggins, New Zealand</i>).	Milking machinery.
547	Noad, J., and Townsend, E. J. . .	Securing milk cans to doors.
1,198	Salway, S. B.	Teat cups.
1,219	Galbraith, D. R. S.	Treating cream.
2,287	Heathcote, J. W.	Cream separating apparatus.
2,373	Foulkes, R.	Delivering milk to consumers.
2,448	Westwood, H.	Milk cans.
2,689	Weiss, S.	Filtering and cooling apparatus for hygienic milking.
2,820	Ridd, A.	Milking machines.
3,022	Franklin, A. C.	Cheese-cutting machines.
3,302	MacTaggart, J. D.	Vessels for transporting milk.
4,527	Borgström, A. H.	Manufacture of butter.
4,864	Westaway, J.	Carrying cream, milk, etc.
4,945	Jacobi, H.	Mechanical cleaners of milk cans.
5,083	Cotton, George	Milking pails, covers, etc.
5,103	Westwood, H.	Refrigerators for dairy purposes.
5,133	Frye, G. V.	Treating milk to produce a solid therefrom.
5,383	Lillard, La F., and Turner, B.C.H.	Cream separator and churns.
5,654	Frost, A. E.	Top or cover for milk churns.
5,810	Schon, E. V.	Butter manufacture.
5,820	Kregelius, P.	Milk pails.
5,918	Bywater, J.	Cans or vessels for transit of milk.
6,022	Sundberg, G. J., and Hägg, C. J. . .	Milking machines.
6,388	Wallwork, R. and C. H.	Butter churns
6,436	Stanley, J. E., and others	Milk cans.
6,444	Frye, G. V.	Processes of butter-making.
7,413	Freeth, F. H., and Dairy Outfit Co., Ltd.	Milk churns and lids.
7,519	Warner, W.	Treating butter.
7,665	Grimes, E. C.	Milk cans or churns.
7,697	Steade, E.	Apparatus for carrying milk.
7,981	Water, S. J., and Skinner, C. W. . .	Churn.
8,164	Gillies, A.	Pneumatic mouthpiece for teat cups of milking machines.
8,274	Dike, D. W.	Combination knee rest and ear attachments for milking buckets.
9,032	Abbott, B., and others	Churn neck and cover.
9,087	Warth, E. R., and Hand, G. . . .	Milk churns.
9,106	Wedemann, R.	Preparing skimmed milk.
9,932	Grünblatt, A.	Vegetable butter.
10,117	Pfeideser, K.	Blending butter.
10,287	Ahlborn, E.	Machines for making or kneading butter.
10,332	Webb, L. G.	Cow-tail holders.

APPLICATIONS FOR PATENTS FOR DAIRY APPLIANCES, &c.

From Jan. 1st to Dec. 31st, 1908.

No. of Application.	Name of Applicant.	Subject of Invention.
10,474	Stephens, H.	Safety milk cans.
10,702	Gillies, A.	Mouthpiece for teat cups of milking machines.
10,734	Hamilton, J.	Milking of cows.
12,378	Liversedge, A. J.	Butter and butter substitutes.
12,516	Bergell, P., and another ..	Method of making milk for infants.
12,696	Anthony, J. S.	Lid for railway milk churns.
13,427	Peters, J. H.	Butter cutting and cooling machines.
13,940	Taylor, E. Z.	Paper vessels for delivery of milk, etc.
14,249	Shavoff, S.	Preparation of coagulated milk.
14,250	Quayle, E. J.	Appliance for cutting cheese.
14,813	Breite, S.	Milking machine.
14,887	Hamilton, J.	Milking cows.
15,224	Marshall, W.	Dessicated milk cake.
15,812	Eddison, G.	Milking cows.
16,729	Enlenfeld, F. Von	Machine for spreading butter.
17,233	Bentley, J. J., and Day, C. F. ..	Milk cans.
17,272	Mortensen, O.	Milking apparatus.
17,402	Milbourne, J. P.	Skimmed-milk separator.
17,518	Nielsen, J.	Milking machines.
17,949	Williams, J. O., and Webb, W. W.	Locking device for milk cans.
18,690	Stanley, E.	Milk cans.
18,740	Gillies, A.	Teat cup for pneumatic milkers.
19,323	Baker, F. O.	Combined churn, cooler, heater, etc.
19,759	Gameson, C. H.	Railway milk cans.
19,818	Haddan, H. J.	Milking machines.
19,819	Haddan, H. J.	Milking machines.
20,378	Baxter, R. P.	Cheese cutter.
20,385	Hampel, A. K.	Butter-kneading machine.
20,845	Holland, W. T.	"Joint and hook" milk can.
21,598	Longstaff, J.	Milk churns.
22,697	Jarrett, G.	Cream containers for dairy use.
22,745	Lindström, K. I.	Milking machines.
23,168	Dickin, W.	Pressing cheese or curd.
23,565	Cleland, J., and another ..	Device for delivery of milk.
23,596	Jones, T. A.	Apparatus for delivery of milk.
24,238	Carlson, C. A.	Churning process.
24,568	Wilson, A. C., and another ..	Cheese ripener, etc.
25,108	Quayle, E. J.	Cheese-cutting device.
25,185	Henrichsen, J. and C. J. ..	Milking appliances.
25,526	Hagg, F. E.	Churns.
25,900	Rawlston, W. D.	Carrying milk cans.
26,908	Bagguley, W.	Cheese-cutting appliance.
27,607	Gameson, C. H.	Milk cans, churns, etc.
28,443	Wells, E. S.	Butter-cutting machine.
28,472	Taylor, E. Z.	Paper vessels for delivery of milk, etc.

British Dairy Farmers' Association.

EXAMINATION FOR BUTTER-MAKING, CHEESE-MAKING,
AND DAIRY TEACHERS' CERTIFICATES AT THE
DAIRY DEPARTMENT, COUNTY LABORATORIES,
CHELMSFORD, ON MONDAY, TUESDAY, AND
WEDNESDAY, MAY 25TH, 26TH, AND 27TH, 1908.

EXAMINERS: MR. ALEC. TODD and MR. F. J. LLOYD, F.C.S.

Three hours are allotted to Candidates for Dairy Teachers' Certificates, or both Butter and Cheese Making Certificates; and two hours to Candidates for either Cheese-making or Butter-making Certificates. Candidates will also be examined *viva voce*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

Candidates are required to answer the following questions:—

FOR BUTTER-MAKING CERTIFICATE Nos. 1 to 8, inclusive.

FOR CHEESE-MAKING CERTIFICATE Nos. 1 to 4 and 9 to
12, inclusive.

FOR DAIRY TEACHERS' CERTIFICATE .. Nos. 1 to 14, inclusive.

QUESTIONS.

1. Give the composition of milk from Shorthorn, Jersey, and Ayrshire Cows. State briefly which would be best and most profitable for making (1) Butter, (2) Cheese.
2. What are the best tests for determining whether milk is tainted or not?
3. What points are the most important in choosing a separator?
4. Would you recommend pasteurising milk for butter and cheese making?
5. Which is preferable, thick or thin cream, for churning? Give reasons for your statement.
6. On what two conditions does the keeping property of butter mainly depend?

7. What faults in butter-making diminish or destroy the colour of the butter, and why ?
8. What are the chief differences between fine grain and coarse grain butter ? Explain why these exist.
9. What is rennet ? What takes place when it is added to milk ?
10. Under what conditions would you vary the amount of rennet used in cheese making ?
11. Assume that you are making cheese without a starter. How would you proceed (a) when the milk was too sweet, (b) when the milk was too acid ?
12. What is the average loss of Cheddar cheese in the curing room ? If higher or lower, what might be the cause ?
13. State the shapes, names, and mode of living of some bacteria which play an important part in the dairy industry.
14. What are the Government limits for (a) Fat in milk, (b) Water in butter ? Discuss these.

**EXAMINATION FOR DIPLOMA AND CERTIFICATES AT
THE BRITISH DAIRY INSTITUTE, READING, ON
THURSDAY, FRIDAY, AND SATURDAY, JUNE 11TH,
12TH, AND 13TH, 1908.**

**EXAMINERS : MR. DRYSDALE TURNER, MR. GEORGE GIBBONS,
and MR. F. J. LLOYD, F.C.S.**

Two hours are allotted to Candidates for Cheese-making, Butter-making, or Elementary Teachers' Certificates ; and three hours to Candidates for Dairy Teachers' Certificates, or both Butter and Cheese Making Certificates.

The written part of the Examination for the Diploma will be divided into two parts : the first three hours being devoted to the 14 questions contained on this sheet. After an interval of an hour-and-a-half, Diploma Candidates will be allowed a further two hours to answer eight additional questions.

Candidates will also be examined *vis à vis*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

Candidates are required to answer the following questions :—

FOR BUTTER-MAKING OR ELEMENTARY

TEACHERS' CERTIFICATE Nos. 1 to 8, inclusive.

FOR CHEESE-MAKING CERTIFICATE Nos. 1 to 4 and 9 to
12, inclusive.

FOR DAIRY 'TEACHERS' CERTIFICATE OR DIPLOMA	.. .. .	Nos. 1 to 14, inclusive.
FOR DIPLOMA	.. .. .	Second paper (as above stated).

QUESTIONS.

1. There is often a difference in the morning's and evening's milk from the same cows? Why is this? Could it be prevented?
 2. What percentage of acidity do you prefer in cream for churning?
 3. What are the advantages derived from the cream having this acidity?
 4. Explain the differences between two separators with which you are acquainted, stating the object of these differences.
 5. In adding water to the cream in churn from breaking stage onward, what rules would guide you as to the quantity used and its temperature?
 6. What are the two principal faults in the making of butter which diminish its keeping quality?
 7. Should the grains of butter when removed to the worker be the same size at all periods of the year? Give reasons for your answer.
 8. Why are some bacteria beneficial and others injurious in butter-making (discarding disease-producing organisms)?
 9. How do you manage your evening's milk for cheese-making (*a*) when the temperature of the dairy is 75° F.? (*b*) when it is 55° F.?
 10. When would you consider your mixed milk to be very acid? And how would you then treat it to make a good cheese?
 11. Of what is whey composed? How can the best value be made of it?
 12. What are the two conditions essential in the curd when ground to ensure a good cheese?
 13. How would you *demonstrate* to a class the composition of milk and the chief properties of its constituents?
 14. What system of tests for dirt or taints in milk, could be adopted regularly in a butter or cheese factory?
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SECOND PAPER FOR DIPLOMA CANDIDATES.

Two hours allowed.

QUESTIONS.

15. State what matters would guide you in your choice in selecting a dairy farm of 200 acres. Mention where you would go expecting to find such a farm; and also state the number of cows and other stock the farm should be able to keep.
16. What quantity of milk would you expect annually from the above herd? Compare from financial and other points of view the returns which might be expected from the sale of milk, and from the manufacture of butter and cheese respectively.
17. Say what precautions you would advise being taken on the farm as regards the management of the cows, milking, etc., with the object of providing a pure supply of milk for purposes of sale.
18. Give the average composition of the following feeding stuffs, and express an opinion as to their value for the production of milk, viz.:—Decorticated Cotton Cake; Dried Brewers' Grains; Linseed Cake; Swedes; Maize.
19. Discuss the best methods of manuring grass-land for dairy purposes. Give the composition and market value of any manures you may mention.
20. Mention any flies you know of which are injurious to milking stock; and describe their life histories, and the best means of preventing their attacks.

EXAMINATION FOR DIPLOMA AND CERTIFICATES AT
THE BRITISH DAIRY INSTITUTE, READING, ON
THURSDAY, FRIDAY, AND SATURDAY, SEPTEMBER
*10TH, 11TH, AND 12TH, 1908.

EXAMINERS: MR. WILLIAM ASHCROFT, MR. T. C. CANDY,
and MR. F. J. LLOYD, F.C.S.

Two hours are allotted to Candidates for Cheese-making, Butter-making, or Elementary Teachers' Certificates; and three hours to Candidates for Dairy Teachers' Certificates, or both Butter and Cheese Making Certificates.

The written part of the Examination for the Diploma will be divided into two parts, the first three hours being devoted to the 14 questions contained on this sheet. After an interval of an hour-and-a-half, Diploma Candidates will be allowed a further two hours to answer eight additional questions.

Candidates will also be examined *viva voce*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

Candidates are required to answer the following questions :—

FOR BUTTER-MAKING OR ELEMENTARY TEACHERS' CERTIFICATE	Nos. 1 to 8, inclusive.
FOR CHEESE-MAKING CERTIFICATE	Nos. 1 to 4 and 9 to 12, inclusive.
FOR DAIRY TEACHERS' CERTIFICATE OR DIPLOMA	Nos. 1 to 14, inclusive.
FOR DIPLOMA	Second paper (as above stated.)

QUESTIONS.

1. What are the various constituents of milk, and how do they exist therein ?
2. Describe how you would test milk for specific gravity, fat, and total solids ?
3. Give the average chemical composition of :—
Milk from Jersey cows.
" " Shorthorn cows.
Butter-milk.
4. Is the first drawn milk of the same composition as the last drawn ? If not, what is the difference, and can you explain it ?
5. What consistency of cream would you separate for butter-making, and why ?
6. Why is it desirable to ripen cream, and how can it be done ?
7. If by the Gerber you found milk to contain 3.5 per cent. of fat, how much butter would you expect to obtain per gallon ?
8. How would you treat milk for butter-making when tainted by food ?
9. State briefly three or four of the conditions which are essential to the production of a good cheese, placing them in the order of their importance.
10. Explain the difference between the manufacture of a quick and slow ripening cheese, and state the object in view of each difference.
11. What are the causes of :—
 1. A soft black curd before it is vatted ?
 2. The curd when cut showing two colours ?
12. What are the principal chemical changes which take place in the ripening (*a*) of hard cheeses, (*b*) of soft cheeses ?
13. Describe to a class the characteristics of the lactic acid bacteria, and their use in the manufacture of dairy products.
14. Fully explain the principles of churning as you would to elementary students.

SECOND PAPER FOR DIPLOMA CANDIDATES.

Two hours allowed.

QUESTIONS.

15. Make a valuation at Michaelmas of the live and dead stock, hay, straw, and corn on a 400-acre farm of which half is arable, half pasture. The land is of good quality, and sheep and a herd of dairy cattle are kept. Value the tillages on the fallow crops separately.
 16. Describe the appearance and characteristics of the following three breeds of pigs:—Large White, Berkshire, and Tamworth. Also the feeding and management of sows, and of young pigs up to six months' old.
 17. What quantities would you allow your horses on a farm where the following foods are given :—
 - (a) Hay and oats ?
 - (b) Hay, oats, and maize ?
 - (c) Hay, oats, and beans ?
 18. How would you prevent and treat parturient apoplexy in the cow, and colic in the horse ?
 19. Give the manurial constituents of nitrate of soda, sulphate of ammonia, superphosphate, and basic slag. Which of the above would you use, and in what quantities, as a top dressing for barley after wheat and for swedes and mangolds, no dung being available ?
 20. What is the composition of good meadow hay, oat straw, mangolds, and decorticated cotton cake ?
 21. Give a feeding ration for cows of the ordinary cross-bred shorthorn type in summer and winter :—
 - (a) Where milk is sold ?
 - (b) Where the milk is made into butter ?
 22. Distinguish between the harvesting of oats and barley, and and what would be good average crops of each ?
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EXAMINATION RESULTS, 1908.

EXAMINATION FOR BUTTER-MAKING, CHEESE-MAKING, AND DAIRY TEACHERS' CERTIFICATES AT THE DAIRY DEPARTMENT, COUNTY LABORATORIES, CHELMSFORD, ON MONDAY, TUESDAY, AND WEDNESDAY, MAY 25TH, 26TH, AND 27TH, 1908.

A Teacher's Certificate for Proficiency in the Science and Practice of Dairying to Miss Mary P. Comer and Albert Ricketts.

A Certificate of Merit for Proficiency in the Theory and Practice of Cheese-making to John A. Clinch.

A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making to John A. Clinch and Wm. Gennill.

EXAMINATION FOR DIPLOMA AND CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING, ON THURSDAY, FRIDAY, AND SATURDAY, JUNE 11TH, 12TH, AND 13TH, 1908.

A Diploma and Silver Medal for Proficiency in the Science and Practice of Dairy Farming and Dairying to Miss Dora G. Saker and Alex. V. D. Bintoni.

A Teacher's Certificate for Proficiency in the Science and Practice of Dairying to Miss Annie W. Leighton.

A Certificate of Merit for Proficiency in the Theory and Practice of Cheese-making to Miss Margaret T. D. Phillips, J. C. Jesser Coope, Philip Crowley, Miss Stella Sapsed, Miss Katie Evans, and Miss D. H. Penton.

A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making to Miss Margaret T. D. Phillips, J. C. Jesser Coope, Philip Crowley, Miss Stella Sapsed, Miss Katie Evans, Miss D. H. Penton, and Miss O. G. T. Pigott.

EXAMINATION FOR DIPLOMA AND CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING, ON THURSDAY, FRIDAY, AND SATURDAY, SEPTEMBER 10TH, 11TH, AND 12TH, 1908.

A Diploma and Silver Medal for Proficiency in the Science and Practice of Dairy Farming and Dairying to Philip Crowley, J. C. Jesser Coope, A. Gordon McKenzie, Miss Annie Wrote Leighton, and Miss Stella Sapsed.

A Certificate of Merit for Proficiency in the Theory and Practice of Cheese-making and Butter-making to Rafiq M. Kahn and Miss Kathleen R. West.

A Certificate of Merit for Proficiency in the Theory and Practice of Cheese-making to Miss Olive G. T. Pigott.

A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making to Miss Mary Graham and R. A. Rashid.

REVISED REGULATIONS GOVERNING EXAMINATIONS FOR CERTIFICATES AND DIPLOMAS.

The Association grants to any Candidate, male or female, who satisfactorily passes the necessary Examinations:—

- (a) **A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making.** Entry Fee, 5s.
- (b) **A Certificate of Merit for Proficiency in the Theory and Practice of Cheese-making.** Entry Fee, 5s.
- (c) **A Teacher's Certificate for Proficiency in the Science and Practice of Dairying.** Entry Fee, 10s.
- (d) **A Diploma and Silver Medal for Proficiency in the Science and Practice of Dairying and Dairy Farming.** Entry Fee, 10s.

The Examinations, which will extend over two or more days, will test (firstly) the Theoretical Knowledge of the Candidates, (secondly) their Practical Skill in Butter-making or Cheese-making, or both. Each Competitor will be required to answer, in writing, a set of questions within a given time, and will also be examined *viva voce*. The Practical Examinations will take place on the same or on the following day, at a suitable Dairy.

Candidates for the Butter-making Certificates must produce satisfactory evidence that they have received at least three months' instruction (not necessarily at a Dairy School) in the Theory and Practice of Butter-making. They must possess an elementary knowledge of Chemistry and Bacteriology so far as they relate to the use of Milk, Cream, and Butter, and a fair knowledge of Sections 1, 2, 3, and 5 of the following syllabus. They will be required to make Butter.

Candidates for the Cheese-making Certificate must produce satisfactory evidence that they have received at least six months' instruction (not necessarily at a Dairy School) in the Theory and Practice of Cheese-making. They must possess an elementary knowledge of Chemistry and Bacteriology so far as they relate to Milk and Cheese, and also a fair knowledge of Sections 1, 4, and 5 of the following syllabus. They must have full knowledge of the production of one variety of Hard Cheese, also a general knowledge of the manufacture of other varieties of hard cheese, and of soft cheeses. They will be required to make at least one British Cheese of not less than 25lbs. weight (or Stilton, 10lbs.).

Candidates for a Teacher's Certificate must have been well trained, and have previously gained the Butter and Cheese Making Certificates,* and produce satisfactory evidence that they have received not less than twelve months' instruction at a Scientific Training Centre.

They will be expected to possess a detailed and precise knowledge of Sections 1 to 5 of the Syllabus, to understand the General Management and Feeding of Dairy Cattle, and to give evidence of their ability to Teach and Elucidate the Elementary Principles and Practice of Dairying.

Candidates for the Diploma must produce satisfactory evidence that they have received not less than one year's scientific and practical instruction at some recognised Centre for Dairying Instruction, and have spent at least twelve months on a Farm.

They must have gained the Butter and Cheese Making Certificates at an examination preceding the examination for the Diploma. They will be expected to possess a detailed and precise knowledge of all the Sections of the Syllabus, an elementary knowledge of Chemistry and Bacteriology in its relation to Soils, Manures, Foods, and Dairy Produce; Botany, in its relation to Farm Plants; and Physiology and Veterinary Science in their relation to the Feeding and Treatment of Farm Stock in Health and Disease.

Candidates are at liberty to bring their own utensils for the Practical Examination if they wish to do so.

Candidates are only eligible to be awarded the particular Certificate for which they enter.

Examinations for the Butter-making and Cheese-making Certificates will be held twice a year, viz., in the Spring and Autumn; and the Examinations for the Teachers' Certificates and Diploma in the Autumn only.

* Certificates of equal value to the B.D.F.A. Cheese and Butter Certificates, granted by other institutions, will be accepted as an equivalent.

SYLLABUS.

1. Milk.—The Yield of Milk from various breeds; the Production of Milk; Milking; Composition of Milk; Fluctuations in Yield and Quality, with their causes; the Nature and Properties of the Constituents of Milk; the Chemical Analysis of Milk; the Microscopical and Bacteriological Examination of Milk; Colostrum; Methods of Utilizing, Preserving, and Distributing Milk; Taints in Milk, their causes and cure.
2. Cream.—The Various Methods of Obtaining Cream; Construction and Use of the Utensils employed—Separators; the Composition of Cream; the Analysis of Cream; the Ripening of Cream; the Chemical and Bacteriological Changes in Cream; the Preparation of Cream for Market; the Preparation of Cream for Butter-making; the Utilization of Separated or Skim-milk.
3. Butter.—The Various Methods of Obtaining Butter; the Utensils employed and the Principles involved; Conditions which affect the Butter Yield; Butter-milk; the Composition and Properties of Good Butter; Faults in Butter-making; the Chemical and Bacteriological Examination of Butter.
4. Cheese.—Rennet; the Action of Rennet on Milk; the Scientific Principles of Cheese-making and Cheese-ripening; the Chemistry and Bacteriology of Cheese; the Composition of Cheese and of the By-products of its Manufacture; the Detailed Principles and Practice for the Manufacture of One Variety of Hard Cheese; the General Practice of Manufacture of other Hard, and of Soft Cheeses; the Composition and Utilization of Whey; the Manufacture of Whey Butter.
5. The Keeping of Dairy Records, and the General Book-keeping of a Dairy.
6. Dairy Farming.—Its Principles and Practice, with the Management of the Dairy Farm; Implements and Machinery; Manures; Crops; Stock and Finances.
7. Crops and Feeding Stuffs.—The Cultivation, Manuring, Sowing, Reaping, and Harvesting of Farm Crops; their Composition and Utilization. Artificial Feeding Stuffs—their Production, Composition, and Utilization.
8. Live Stock.—The Varieties; Peculiarities; Breeding, Rearing, and Management of the Live Stock of a Farm.
9. Book-keeping of a Dairy Farm.

EXAMINATIONS AT LOCAL CENTRES.

In order to meet the convenience of pupils at Dairy Schools, members of local Societies, and other persons, the Association will conduct Examinations for its Diplomas and Certificates at any place in the United Kingdom upon receiving satisfactory proof that the following conditions will be observed:—

That the School, Society, County Council, or other body requesting such an Examination to be held, undertake to supply all necessary appliances and materials, and pay the fees and expenses of the Examiners. The milk supplied must be free from preservatives and fit for cheese-making.

In all cases two Examiners will be appointed. An additional Examiner may be required in the Examination for Diplomas.

Elementary Teacher's Certificate of Competency in Dairy Work.

The Association also grants to any Candidate who can satisfactorily pass the necessary Examinations:—

AN ELEMENTARY TEACHER'S CERTIFICATE FOR PROFICIENCY IN THE THEORY AND PRACTICE OF BUTTER-MAKING.

Such Certificates (as well as the Association's ordinary Certificates) will be accepted by the Right Honourable the Lords of the Committee of the Privy Council on Education, for the purposes of Article 101 (*i*) of the Education Code, 1893, and Article 13 (*e*) of the Evening Continuation School Code. Candidates, who must have undergone practical instruction in Butter-making for at least twenty days, will be required to show their practical skill in Butter-making, and to satisfactorily answer in writing, within a given time, a set of questions on the following subjects:—

1. Milk.—Its Production, Composition, and Properties. Methods of Testing, Preserving, Distributing, &c. The Utilization of Skim Milk.
2. Cream.—Its Production, Composition, and Properties.
3. Butter.—Its Production, Composition, and Properties.

Candidates will also be examined *vis à voce*.

The Elementary Teacher's Certificates are in the following form:—

This is to certify that _____ has attended the Dairy School Classes of the _____
 at _____ for a period of * _____
 viz., from _____ to _____
 and has during the whole of that period undergone practical instruction in Butter-making; that _____ has received some instruction in the Theory of Butter-making, and has written a paper on the subject, displaying an intelligent knowledge thereof; and that _____ is consequently qualified to give instruction in the practice of Butter-making to children in Public Elementary Schools.

Particulars and Entry Forms may be obtained of

The SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

12, Hanover Square, London, W.

ANNUAL REPORT OF THE CONSULTING CHEMIST FOR 1908.

F. J. LLOYD, F.C.S., F.I.C.

The number of samples which were sent me last year for analysis is much smaller than in preceding years. I should have been inclined to attribute this to some personal factor did I not find that the Consulting Chemist to the Royal Agricultural Society, and also the Chemist of the Highland Agricultural Society, have experienced a similar diminution in the number of samples submitted to them.

What is the meaning of this ?

Different people hold different views as to the cause, but probably most agree in believing that it is in part due to the general depression in business which has prevailed during the past year. The farmer, like everyone else, has had to think twice before spending money. He has naturally tried to save any expense which did not appear essential. The question thus arises, is the cost of analysis *essential* to the business of a dairy farmer ? It must be self evident that if business is bad the vendors of materials will invariably try to lose no penny by giving better quality than they are bound to. On the other hand, the crafty trader, knowing how blindly men will purchase whatever seems to be "cheap," quite irrespective of its quality, supplies a "cheap" adulterated article, and trusts to luck not to be found out. The result is that during the past year there has been quite an exceptional amount of inferior and sometimes adulterated material sold, but, owing to the proverbial apathy of the farmer, they have preferred in many cases to waste pounds on rubbish rather than spend shillings on analyses.

The total number of samples which I analysed for the Association during the year was 354. Of these, 239 were samples of milk taken at the Dairy Show, and four of separated milks in connection with the judging of new inventions. The 111 samples received from members of the Society were made up as follows :—

73	Milks
13	Cream, mostly for boric acid
9	Butters
6	Separated milks
2	Mangolds
2	Waters
2	Basic slag
1	Superphosphate
1	Muriate of potash
1	Cotton-seed meal
1	Rice meal

The majority of the milk samples were sent merely for an ordinary analysis. Some were sent for a bacteriological examination for tubercle bacilli. Every year will see greater precautions being taken, not only by medical officers of health and local authorities, but by the general body of milk consumers, to ensure the cleanliness and freedom from tubercle bacilli of the milk supply. It therefore behoves dairy farmers to keep a sharp watch on any cows which may be suffering in the udder, and should such trouble be persistent, it is well to have the milk examined for tubercle bacilli. Several members have written to know whether I thought it desirable to have the whole milk supply examined. My reply has always been in the negative. According to my experience, tubercle bacilli are present in milk so rarely that it is waste of money to have the milk of apparently healthy cows examined.

The analyses of the two samples of mangolds are interesting and instructive. The roots were grown on different soils and were different in size, but were neither very large nor very small roots. I was surprised at the very considerable difference between them in feeding value. The results were as follows:—

	Small Roots	Large Roots
Water	88.40	91.10
*Dry matter	11.60	8.90
	100.00	100.00
*Containing—		
Sugar	5.80	3.49
Extractives ..	1.24	.67
Albuminoids ..	.88	1.14

The two samples of water both came from the same source at different periods of the year. They were, like most of the samples of drinking water which I receive from farms and country mansions, far from satisfactory for domestic purposes. When will people realize that we are absolutely destroying the sources of all pure water throughout the length and breadth of the land by contaminating the soil and subsoil waters with cess-pits and burial grounds, while all our streams are converted into sewage courses.

ANNUAL REPORT OF CONSULTING BOTANIST FOR 1908.

Professor JOHN PERCIVAL, University College, Reading.

The enquiries received during the past season referred chiefly to fungi and weeds on pasture land. The fungi proved to be harmless species of *Agaricus* and *Clavaria*. In cases where toad-stools and similar fungi are abundant they may be destroyed by an application of sulphate of ammonia.

Most of the weeds on pasture and meadows were the results of impoverished conditions. Our experience has shown that a vast amount of grass land in many parts of the country is in a poor state, and needs a good dressing of some phosphatic manure (basic slag on the stiffer soils, superphosphate where it is lighter and well supplied with lime), as well as kainit in cases where dung is not available. These should be put on in winter, and followed by a dressing of $\frac{3}{4}$ cwt. of nitrate of soda in spring. Until some such treatment is carried out, the herbage will remain of poor quality, and weeds and plants of low value will prevail.

It is hoped that more members will avail themselves of the services of the Consulting Botanist, who will be glad to give advice on the management of worn-out grass land, as well as on other points referred to in the list on page 218.

AWARD OF PRIZES, DAIRY SHOW, 1908.

COWS AND HEIFERS IN MILK.

Class 1—SHORTHORN COWS.—Entered in or eligible for Coates' Herd Book, or its pedigree sent for such entry previous to the Show.—*First Inspection Prize* (£10). *First Milking Trial Prize* (£20). The "Barham" Challenge Cup, The "Spencer" Challenge Cup, The Lord Mayor's Champion Cup, The Shorthorn Society's Prize (£10), to Lord Rothschild, Tring Park, Herts, for "Dorothy." *Second Inspection Prize* (£5) to Edward S. Godsell, Salmons Spring Brewery, Stroud, Glos., for "Darlington Cranford 11th." *Third Inspection Prize* (£3) to Lord Rothschild for "Red Rose 3rd." *Second Milking Trial Prize* (£10) to Lord Rothschild for "Darlington Cranford 5th." *Third Milking Trial Prize* (£5) to Robert W. Hobbs & Son, Kelmscott, Lechlade, Glos., for "Decentia 34th."

Class 2—SHORTHORN COWS.—Not eligible for Class 1.—*First Inspection Prize* (£10) to John H. Maden, Rockcliffe House, Bacup, Lancs., for a light roan cow (No. 39). *Second Inspection Prize* (£5) and *First Milking Trial Prize* (£20) to J. L. Shirley, Bletchley, for "Muisie." *Third Inspection Prize* (£3) to Sam. S. Raingill, The Grange, Ringway, Altrincham, for "Victoria." *Second Milking Trial Prize* (£10) to Geo. B. Nelson, Cockerham Hall, Garstang, for "Pet." *Third Milking Trial Prize* (£5) to Geo. B. Nelson for "Daisy."

Class 3—LINCOLNSHIRE RED SHORTHORN COWS.—Entered in or eligible for the Herd Book of the Lincolnshire Red Shorthorn Association.—*First Inspection Prize* (£10) to John Evens, Burton, near Lincoln, for "Burton Spotted 5th." *Second Inspection Prize* (£5) to Fred Scorer, Nettleham Lodge, Lincoln, for "Bracebridge Fulleby." *Third Inspection Prize* (£3) to John Evens for "Burton Profit 3rd." *First Milking Trial Prize* (£20) to Fred Scorer for "Bracebridge No. 102." *Second Milking Trial Prize* (£10) to John Evens for "Burton Nancy 4th."

Class 4—SHORTHORN HEIFERS, not exceeding three years.—Entered in or eligible for Coates' Herd Book.—*First Inspection Prize* (£5) to J. W. Sanders, Gilmorton, Lutterworth, for "Nelly Lee 24th." *Second Inspection Prize* (£3) to George Taylor, Cranford, Hounslow, for "Wild Cran 12th." *Third Inspection Prize* (£2) to C. R. W. Adeane, Babraham Hall, Cambridge, for "Babraham Pretty Pippin." *First Milking Trial Prize* (£7) to George Taylor for "Oxford Bride." *Second Milking Trial Prize* (£4) to Wm. Nisbet, Lordship, Hinxton, Saffron Walden, for "Bendyshe Belle." *Third Milking Trial Prize* (£2) to C. R. W. Adeane, for "Babraham Jessica."

Class 5—SHORTHORN HEIFERS, not exceeding three years.—Not eligible for Class 4.—*First Inspection Prize* (£5) and *First Milking Trial Prize* (£7) to John Evens, Burton, near Lincoln, for "Burton Ruby 12th." *Second Inspection Prize* (£3) and *Second Milking Trial Prize* (£4) to John Evens for "Burton Plenty 5th."

Class 6—JERSEY COWS.—Entered in or eligible for the Herd Book.—*First Inspection Prize* (£7) and the "Blythwood" Challenge Bowl to The Lady de Rothschild, Aston Clinton, Tring, for "Jersey Dame." *Second Inspection Prize* (£4) to A. Miller-Hallett, Goddington, Chelsfield, Kent, for "Vanilla II." *Third Inspection Prize* (£2) and *Half Second Milking Trial Prize* of £10 to R. Bruce Ward, Westwood, Droitwich, for "Mrs. Viola." *First Milking Trial Prize* (£15) to A. Miller-Hallett for "Goddington Pipkin II." *Half Second Milking Trial Prize* of £10 to J. H. Smith-Barry, Stowell Park, Powsey, Wilts, for "Post Obit."

- Class 7—JERSEY HEIFERS, not exceeding three years.—Bred in Great Britain or Ireland.—Entered in or eligible for the Herd Book.—*First Prize* (£7) to The Rt. Rev. Bishop Fisher, Furgh House, Gt. Yarmouth, for "Burgh Snowdrop." *Second Prize* (£4) to J. H. Smith-Barry, Stowell Park, Pewsey, Wilt., for "Madrigal."
- Class 8—JERSEY HEIFER, not exceeding three years.—Bred in Channel Islands.—Entered in or eligible for the Jersey or English Jersey Herd Book.—*First Prize* (£7) to A. Miller-Hallett, Goddington, Chelsfield, Kent, for "Young Winks IV." *Second Prize* (£4) to Lord Rothschild, Tring Park, Herts, for "Little Red Rose 6th." *Third Prize* (£2) to Lord Rothschild for "Little Sunbeam."
- Class 9—GUERNSEY COWS.—Entered in or eligible for the Herd Book.—*First Inspection Prize* (£7) to Frank Hargreaves, Merton Grange, Gamlingay, Cambs., for "Felois." *Second Inspection Prize* (£4) and *First Milking Trial Prize* (£15) to E. A. Hambro, Hayes Place, Hayes, Kent, for "Queen of the Roses." *Second Milking Trial Prize* (£10) to E. A. Hambro for "Muriel 11th."
- Class 10—GUERNSEY HEIFERS, not exceeding three years.—Entered in or eligible for the Herd Book.—*First Prize* (£7) to E. A. Hambro, Hayes Place, Hayes, Kent, for "Hayes Golden Cherry 3rd." *Second Prize* (£4) to E. A. Hambro for "Hayes Golden Cherry 4th."
- Class 11—RED POLLED COWS.—Entered in or eligible for the Herd Book.—*First Inspection Prize* (£7) to Lord Rothschild, Tring Park, Herts, for "Cheddar." *Second Inspection Prize* (£4) to The Earl of Radnor, Longford Castle, Salisbury, for "Mona." *Third Inspection Prize* (£2) to Kenneth M. Clark, Sudbourne Hall, Orford, Suffolk, for "Dotty 1st." *First Milking Trial Prize* (£15) to Lord Rothschild, for "Rossway Lady."
- Class 12—RED POLLED HEIFERS, not exceeding three years.—Entered in or eligible for the Herd Book.—*First Inspection Prize* (£5) to A. Carlyle Smith, Ashmoor Campsea Ashe, Wickham Market, Suffolk, for "Smith's Wisdom." *Second Prize* (£3) to Kenneth M. Clark, Sudbourne Hall, Orford, Suffolk, for "Sudbourne Abigail 2nd." *First Milking Trial Prize* (£5) to Kenneth M. Clark for "Sudbourne Molly B."
- Class 13—AYRSHIRE COWS.—*First Prize* (£7) to Wm. Nisbet, Lordship, Hinton, Saffron Walden, for "Dallibble Bella 2nd." *Second Prize* (£4) to John Littleton, Arkleby Hall Farm, Aspatria, for "Polly." *Third Prize* (£2) to Geo. B. Nelson, Cockerham Hall, Garstang, for "Spotty."
- Class 14—(Cancelled).
- Class 15—KERRY COWS.—Entered in or eligible for the Herd Book.—*First Inspection Prize* (£7) and *Second Milking Prize* (3) to The Countess de la Warr, Old Lodge, Nutley, Uckfield, for "Buckhurst Zingara." *Second Inspection Prize* (£4) to J. L. Tillotson, Heathfield, Bebington, Cheshire, for "Belvedere Nora." *First Milking Trial Prize*, Cup value £5, offered by the English Kerry and Dexter Cattle Society, and the Lord Mayor's Cup, to The Countess de la Warr for "Buckhurst Peaceful."
- Class 16—DEXTER COWS.—Entered in or eligible for the Herd Book.—*First Inspection Prize* (£7) to the Hon. Mrs. Claud Portman, Goldicote, Stratford-on-Avon, for "Buckhurst Juno." *Second Inspection Prize* (£4) to the Hon. Mrs. Claud Portman for "Compton Dark Beauty." *First Milking Trial Prize* (£3) to Godfrey J. B. Chetwynd, Wyndthorpe, Doncaster, for "Don Gordonia."
- Class 17—PAIR OF COWS OF ANY BREED OR CROSS (in Milk).—*First Prize* (£20) to Sam S. Raingill, The Grange, Ringway, Altrincham, for "Faithful" and "Pansy" (Shorthorns). *Second Prize* (£15) to Geo. B. Nelson, Cockerham Hall, Garstang, for "Polly" and "Sally." *Third Prize* (£10) to John Littleton, Arkleby Hall Farm, Aspatria, for "Lucy" and "Jane."

Fourth Prize (£5) to Geo. B. Nelson for "Dot" and "Buttercup."
Fifth Prize (£3) to John Wilson, Blincogo House, Wigton, for "Polly" and Lissey."

Class 18.—SINGLE COW OF ANY BREED OR CROSS (in Milk).—*First Prize* (£7) to Thomas Jones, Quarry Farm, Godstone, for "Molly" (Shorthorn). *Second Prize* (£5) to Sam S. Raingill, The Grange, Ringway, Altrincham, for "Mayflower" (Shorthorn). *Third Prize* (£4) to John Evens, Burton, near Lincoln, for "Burton Quality 3rd" (Lincoln Red Shorthorn). *Fourth Prize* (£3) to J. L. Shirley, Bletchley, for "Mary" (Shorthorn). *Fifth Prize* (£2) to A. Stapleton & Sons, Ltd., The Brooklands, Stoke Newington Common, for "Prim" (Cross-bred).

BUTTER TESTS.

SHORTHORNS.—Entered in Classes 1, 2, 3, 4, and 5.—*First Prize* (£5 and Silver Medal) to Geo. B. Nelson, Cockerham Hall, Garstang, for "Daisy." *Second Prize* (£2 and Bronze Medal) to Lord Rothschild, Tring Park, Herts, for "Darlington Cranford 5th."

JERSEYS.—Entered in Classes 6, 7, and 8, and eligible for the English Jersey Herd Book.—*First Prize* (Gold Medal or £10) to A. Miller-Hallett, Goddington, Chelsfield, Kent, for "Goddington Pipkin 2nd." *Second Prize* (Silver Medal and £5) and Butter Prize (£1) to Jersey de Knoop, Calveley Hall, Tarporley, Cheshire, for "Muscotah." *Third Prize* (Bronze Medal and £3) to J. H. Smith-Barry, Stowell Park, Pewsey, Wilts, for "Post Obit." These prizes were given by the English Jersey Cattle Society.

ANY OTHER BREED.—Entered in Classes 9 to 16 inclusive.—Prize (£3) to E. A. Hambro, Hayes Place, Hayes, Kent, for "Muriel 11th" (Guernsey). Prize (£3) to The Countess de la Warr, Old Lodge, Nutley, Uckfield, for "Buckhurst Peaceful."

BULLS.

Class 19.—SHORTHORN BULL, twelve months old or over.—Entered in or eligible for the Herd Book.—*First Prize* (£10) to Robert W. Hobbs & Sons, Kelmscott, Lechlade, Glos., for "Tarquin II." *Second Prize* (£5) to A. B. and W. G. Little, Paxcroft Farm, Trowbridge, for "Victory 3rd." *Third Prize* (£3) to Robert W. Hobbs & Sons for "Woolmer's Joy."

Class 20.—JERSEY BULL, above one year and not exceeding three years.—Entered in or eligible for the Herd Book.—*First Prize* (£10) to The Lady de Rothschild, Aston Clinton, Bucks, for "Stormer." *Second Prize* (£2) to W. M. Cazalet, Fairlawn, Tonbridge, for "Oaklands Glory." *Third Prize* (£3) to O. F. Mosley, Old Club Dairy, Melton Mowbray, for "Satan."

Class 21.—BULL OF ANY OTHER PURE BREED, twelve months old or over.—Entered in or eligible for the Herd Book.—Silver Medal to E. A. Hambro, Hayes Place, Hayes, Kent, for "Hayes Coronation 3rd" (Guernsey). Silver Medal to Lord Rothschild, Tring Park, Herts, for "Jacobite" (Red Poll). Silver Medal to Fred Scorer, Nettleham Lodge, Lincoln, for "Bracebridge Dairyman."

BREEDERS' PRIZES.

Silver Medal to each First Prize Cow, Heifer, or Bull in the Show.—To Lord Rothschild, for "Dorothy," No. 8; John Evens, for "Burton Spotted 5th," No. 50; J. W. Sanders, for "Nelly Lee," No. 65; J. S. S. Godwin, for "Jersey Dame," No. 78; Rt. Rev. Bishop Fisher, for "Burgh Snowdrop," No. 100; J. P. Le Marguand, for "Young Winks IV.," No. 115; N. Guilbert, for "Felois," No. 142; E. A. Hambro, for "Hayes Golden Cherry 3rd," No. 145; A. James, for "Cheddar," No. 152;

A. J. Smith, for "Smith's Wisdom," No. 160; J. Mackie, for "Dallible Bella 2nd," No. 164; W. H. Mullins, for "Buckhurst Zingara," No. 173; the Countess de la Warr, for "Buckhurst Juno," No. 180; Robert W. Hobbs & Son, for "Tarquin II.," No. 226; Lord Rothschild, for "Stormer," No. 234; J. L. Shirley, for "Maisie," No. 21; Fred Seorer, for "Bracebridge No. 102," No. 55; George Taylor, for "Oxford Bride," No. 67; John Evans, for "Burton Ruby 12th," No. 73; A. Miller-Hallett, for "Goddington Pipkin II.," No. 86; H. Ozanne, for "Queen of the Roses," No. 139; G. F. McCorquodale, for "Rossway Lady," No. 151; A. H. E. Wood, for "Sudbourne Molly B.," No. 161; W. H. Mullins, for "Buckhurst Peaceful," No. 172.

SHE-GOATS.

Class 22—MILKING CLASS FOR GOATS (any variety).—*First Prize* (Silver Medal and £10) to Miss E. M. Billson, The Wayside, Oadby, Leicester, for "Munelle XI." *Second Prize* (£1 10s.) to Mrs. Handley Spicer, The Glen, Kingsbury, N.W., for "Copthorne Pineapple." *Third Prize* (£1) to Mrs. E. B. Handley Spicer for "Copthorne Plum." The British Goat Society's Challenge Cup and the Baroness Burdett-Coutts Challenge Cup to Mrs. E. B. Handley Spicer for "Broxbourne Topsey."

Class 23—GOATS OF ANY VARIETY that have won one or more First Prizes in Classes other than for Kids or Goatlings on or before September 9th, 1908.—*First Prize* (£2) to Mrs. E. B. Handley Spicer, The Glen, Kingsbury, N.W., for "Broxbourne Topsey." *Second Prize* (£1) to Mrs. E. B. Handley Spicer for "Trima."

Class 24—TOGGENBURG OR OTHER SWISS AND ALPINE PURE OR HALF-BREED SHOWING THE SWISS TYPE.—Not eligible for Class 23.—*First Prize* (£2) to Herbert E. Hughes, The Bungalow, Broxbourne, for "Broxbourne Venus." *Second Prize* (£1) to Miss Emily M. Billson, The Wayside, Oadby, Leicester, for "Munelle XI."

Class 25—HORNED SHE-GOATS.—Not eligible for Classes 23 or 24; over two years on October 1st, 1908.—*First Prize* (£2) to Miss E. M. Pope, The Park, Sandy, for "Broxbourne Blond." *Second Prize* (£1) to B. Ravenscroft, The Noke, St. Albans, Herts, for "Bricket Pretty Polly." *Third Prize* (10s.) to Lady Frieda Cecil, The Mount, Lynnington, Hants, for "Bricket Belladonna."

Class 26—HORNLESS SHE-GOATS.—Not eligible for Classes 23 or 24; over two years on October 1st, 1908.—*First Prize* (£2) to Mrs. Handley Spicer, The Glen, Kingsbury, N.W. *Second Prize* (£1) to B. Ravenscroft, The Noke, St. Albans, Herts, for "Bricket Eva."

Class 27—GOATLINGS (any variety), over twelve months and not over two years on October 1st, 1908.—*First Prize* (£2) to Mrs. E. B. Handley Spicer, The Glen, Kingsbury, N.W., for "Copthorne Pollen." *Second Prize* (£1) to Miss Elsie Mortimer, Wigmore, Holnwood, for "Bricket Flora." *Third Prize* (10s.) to R. J. Pitt, Wellesbourne, Warwick, for "Paulina."

Class 28—FEMALE KIDS (any variety), not exceeding twelve months of age on October 1st, 1908.—*First Prize* (£2) to Miss M. Wilde, Little Gaddesden, Berkhamsted, for "Bricket Lady Bird." *Second Prize* (£1) to Lady Frieda Cecil, The Mount, Lynnington, Hants, for "Red Riding Hood." *Third Prize* (10s.) to Corral Farmer, Loxwood, Billingshurst, Sussex, for "Loxwood Lactifera."

CHEESE (FOR MAKERS ONLY, RESIDING IN ANY PART OF THE UNITED KINGDOM).

- Class 29—CHEDDAR (4 Cheeses).—*First Prize* (£10) to Alexander Cross, Knockdon Farm, Maybole. *Second Prize* (£7) to George Johnstone, Craigaplock, Kirkeudbright, N.B. *Third Prize* (£5) to Robert Stevenson, Boghead, Galston, Ayrshire. *Fourth Prize* (£3) to T. C. Candy, Woolcombe, Cattistock, Dorset. *Fifth Prize* (£2) to Thomas Wither, Awkirk, Lothians.
- Class 30—CHEDDAR TRUCKLES (8 Cheeses).—*First Prize* (£3) to Robert Stevenson, Boghead, Galston. *Second Prize* (£2) to Alexander Cross, Knockdon, Maybole. *Third Prize* (£1) to N. J. Sims, Pitcombe, Bruton, Somerset.
- Class 31—STILTONS (8 Cheeses).—*First Prize* (£10) to Tuxford & Nephews, Melton Mowbray. *Second Prize* (£5) to Joseph Hall, Strathern, Melton Mowbray. *Third Prize* (£2) to Herbert B. Wilford, Long Clawson, Melton Mowbray.
- Class 32—WENSLEYDALE (Stilton-shaped or Flat, 8 Cheeses).—*First Prize* (£5) to Alfred Rowntree, Kirkby Overblow, Parnall, S.O. *Second Prize* (£3) to Alfred Rowntree. *Third Prize* (£2) to Mrs. Willis, Manor House, Carporley, S.O., Yorkshire.
- Class 33—CHESHIRE (4 Coloured Cheeses, not less than 40 lbs. each).—*First Prize* (£10) to Mrs. Mary A. Nummerley, Bradeley Green, Whitechurch. *Second Prize* (£5) to Charles E. Parton, Houghton Hall Farm, Tarporley, Cheshire. *Third Prize* (£2) to John Baguley, Aston Manor Farm, Newport, Salop.
- Class 34—CHESHIRE (4 Uncoloured Cheeses, not less than 40 lbs. each).—*First Prize* (£10) to Charles Price, Onston, Ellesmere, Salop. *Second Prize* (£5) to Charles E. Parton, Houghton Hall Farm, Tarporley. *Third Prize* (£2) to W. H. Hobson, Gousley, Blakenhall, Nantwich.
- Class 35—LANCASHIRE (4 Cheeses).—*First Prize* (£5) to Joseph Shepherd, Lower House Farm, Inglewhite, Goosnargh, Preston. *Second Prize* (£3) to Christopher Collinson, Lower House, Woodplumpton, Preston. *Third Prize* (£2) to Geo. B. Nelson, Cockerham Hall, near Garstang.
- Class 36—DOUBLE GLOSTER (4 Cheeses, from 26 lbs. to 30 lbs. each, total weight not to exceed 120 lbs.).—*First Prize* (£5) to George Prout, Standish Court, Stonehouse, Glos. *Second Prize* (£3) to N. J. Sims, Pitcombe, Bruton, Somerset. *Third Prize* (£2) to James Harding, Spilman's Farm, Hilmarton, Calne, Wilts.
- Class 37—SINGLE GLOSTER (4 Cheeses, from 13 lbs. to 15 lbs. each, total weight not to exceed 60 lbs.).—*First Prize* (£3) to George Prout, Standish Court, Stonehouse, Glos. *Second Prize* (£2) to T. J. S. Davies, Hinton Farm, Berkeley, Glos. *Third Prize* (£1) to T. J. S. Davies.
- Class 38—LEICESTER (4 Cheeses).—*First Prize* (£3) to Joseph Rigby, South Croxton, Leicester. *Second Prize* (£2) to Joseph Rigby. *Third Prize* (£1) to Mrs. A. M. E. Bowmer, The Hays, Barrow-on-Soar, Leicestershire.
- Class 39—DERBY (4 Uncoloured Cheeses, not less than 25 lbs. each).—*First Prize* (£3) to F. W. Gilbert, Ltd., Burnaston Dairy, 248, Uttoxeter Road, Derby. *Second Prize* (£2) to Yoxall and District Co-operative Dairy Society, Yoxall, Burton-on-Trent. *Third Prize* (£1) to Yoxall and District Co-operative Dairy Society.
- Class 40—CARMPHILL (4 Cheeses, not exceeding 8 lbs. each).—*First Prize* (£3) to Chas. Harris & Son, Rectory Farm, Slimbridge, Stonehouse, Glos. *Second Prize* (£2) to Wilts United Dairies, Ltd., Devizes. *Third Prize* (£1) to Cheddar Valley Dairy Co., Ltd., Rooksbridge, Axbridge, Somerset.

Class 41—CREAM CHEESE (made from pure Cream only ; no milk or curd to be added ; 6 Cheeses).—*Two Equal First Prizes* (£1 each) to The Glynde Creameries, Ltd., Glynde, near Lewis, and Dr. H. Corner, Brook House, Southgate, N. *Two Equal Second Prizes* (10s. each) to Chas. Prideaux, Dairy Farms, Motcombe, Dorset, and to H. R. White, Brooklands Dairy, 39, Elm Grove, Southsea.

Class 42—GERVAIS (6 Cheeses).—*First Prize* (£1) to Wilts United Dairies, Ltd., Devizes. *Second Prize* (10s.) to Wilts United Dairies, Ltd.

Class 43—UNRIPENED SOFT CHEESE (other than Cream Cheese or Gervais, made direct from milk ; 4 Cheeses).—*First Prize* (£1) to Offord D. Carter, Great Seabrights Farm, Galleywood. *Second Prize* (10s.) to Wensleydale Pure Milk Society, Ltd., The Dairy, Northallerton, Yorks.

Class 44—RIPENED SOFT CHEESE, other than Cream Cheese or Gervais, made direct from milk ; 4 Cheeses).—*First Prize* (£1) to Miss Elsie G. Cook, Ashford Farm, Ashford, Middlesex. *Second Prize* (10s.) to Miss G. N. Davies, 14, Brecon Road, Merthyr Tydfil.

CHEESE FAIR.

(FOR MAKERS ONLY RESIDING IN ANY PART OF THE UNITED KINGDOM.)

Class 45—CHEDDAR (20 Cheeses).—*First Prize* (Silver Medal and £10) to Robert Stevenson, Boghead, Galston, Ayrshire. *Second Prize* (£7) to Alexander Cross, Knockdon Farm, Maybole. *Third Prize* (£5) to G. D. Templeman, Hambridge, Curry Rivel, Taunton. *Fourth Prize* (£3) to Carey & Portch, Redlynch Park Farm, Bruton. *Fifth Prize* (£2) to G. D. Templeman.

Class 46—CHESHIRE (20 Cheeses).—*First Prize* (Silver Medal and £10 and Lord Mayor's Champion Cup) to Wm. Kelsall, Bettisfield Hall, Whitchurch, Salop. *Second Prize* (£5) to Dale Bros., Brasscy Green Farm, Tarporley, Cheshire. *Third Prize* (£3) to W. H. Hobson, Gousley, Blakenhall, Nantwich. *Fourth Prize* (£2) to Joseph Jones, junr., Horton Farm, Malpas.

COLLECTIONS OF DAIRY PRODUCE.

Class 48—COLLECTION OF BRITISH DAIRY PRODUCE.—*First Prize* (Gold Medal) to Messrs. Alpin & Barrett and the Western Counties Creameries, Ltd., Yeovil.

Class 49—COLLECTION OF COLONIAL DAIRY PRODUCE.—No entry.

BACON.

Class 50—SMOKED (Four Sides).—*First Prize* (Silver Medal) to Roscrea Bacon Factory, Ltd., Roscrea, Co. Tipperary. *Second Prize* (Bronze Medal) to Clements Bacon Curing Co., 20-22, Clarence Road, Bristol.

Class 51—UNSMOKED (Four sides).—*First Prize* (Silver Medal) to Chas. Prideaux, Dairy Farms, Motcombe, Dorset. *Second Prize* (Bronze Medal) to E. E. Pigott, 127, Iffley Road, Oxford.

HAMS.

Class 52—SMOKED (Four Hams).—*First Prize* (Silver Medal) to Palethorpes, Ltd., Dudley Port, Staffs. *Second Prize* (Bronze Medal) to Roscrea Bacon Factory, Ltd., Roscrea, Co. Tipperary.

Class 54—UNSMOKED (over 14 lbs. ; four Hams).—*First Prize* (Silver Medal) to Palethorpes, Ltd., Dudley Port, Staffs. *Second Prize* (Bronze Medal) to Palethorpes, Ltd.

Class 55—SELLING CLASS FOR HAMS, ANY VARIETY (two Hams).—*First Prize* (£2) to Palethorpes, Ltd., Dudley Port, Staffs. *Second Prize* (£1) to Palethorpes, Ltd. *Third Prize* (10s.) to Walter Mitchell & Sons, Ayr.

BUTTER.

Class 56—BUTTER (perfectly free from salt, the produce of Channel Islands Cattle and their Crosses; 2 lbs. in 1 lb. lumps).—*Three Equal First Prizes* (£3 each) to Mrs. G. B. Robinson, Poole House Farm, Nantwich, Cheshire; Ed. Vaughan, Barton Grange, Taunton, Somerset; Mrs. C. M. McIntosh, Havering Park, Romford. *Three Equal Second Prizes* (£2 each) to Henry P. Sturgis, Givons, Leatherhead, Surrey; Mrs. William Irving, Toppin Castle, Heads Nook, Carlisle; Miss E. Masson, The Dairy, Cottage Floors Castle, Kelso, N.B. *Three Equal Third Prizes* (£1 each) to Walter E. Morris, Cheverton Farm, Carisbrooke, Isle of Wight; Major Thurlow, Buckham Hill House, Isfield; The Hon. A. Holland-Hibbert, Munden, Watford.

Class 57—BUTTER (slightly salted, the produce of Channel Islands Cattle and their Crosses; 2 lbs. in 1 lb. lumps).—*Three Equal First Prizes* (£3 each) to Mrs. Wm. Irving, Toppin Castle, Heads Nook, Carlisle; Mrs. G. B. Robinson, Poole House Farm, Nantwich; Mrs. E. A. Peck, Quarry Farm, Moortown, Tavistock. *Three Equal Second Prizes* (£2 each) to Mrs. Frank Ward, Burnville, Tavistock; Hon. A. Holland-Hibbert, Munden, Watford; A. C. de Rothschild, C.V.O., Halton House, Halton, Tring. *Three Equal Third Prizes* (£1 each) to Mrs. A. A. Bere, Emmerford Cove, Tiverton; Mrs. L. R. Mildon, Higher Mead Down, Rackenford, Morechard Bishop; Mrs. Herbert Morrell, Headington Hill Hall, near Oxford.

Class 58—BUTTER (perfectly free from salt, the produce of Shorthorn and other Cattle and their Crosses, except Channel Islands and their Crosses; 2 lbs. in 1 lb. lumps).—*Three Equal First Prizes* (£3 each) to Mrs. G. B. Robinson, Poole House Farm, Nantwich; Mrs. E. Dickson Park, Sedgmoor, Londwater, Bucks; Mrs. L. R. Mildon, Higher Mead Down, Rackenford, Morechard Bishop, Devon. *Three Equal Second Prizes* (£2 each) to Miss M. K. Harris, Brownsall Farm, Stourton Caundle, Stalbridge, Dorset; Miss Mary Dalrymple, Elliston, St. Boswells, N.B.; James Gooderham, Dairy Farm, North Lopham, Thetford, Norfolk. *Three Equal Third Prizes* (£1 each) to Mrs. Wm. Irving, Toppin Castle, Heads Nook, Carlisle; William Rennie, Parkhead, Slamannan, Stirlingshire; Mrs. John Way, West Bridge, Bishop's Nympton, South Molton.

Class 59—BUTTER (slightly salted, the produce of Shorthorn and other Cattle and their Crosses, except Channel Islands and their Crosses; 2 lbs. in 1 lb. lumps).—*Three Equal First Prizes* (£3 each) Mrs. G. B. Robinson, Poole House Farm, Nantwich, Cheshire; James Gooderham, Dairy Farm, North Lopham, Thetford, Norfolk; Mrs. E. A. Peck, Quarry Farm, Moortown, Tavistock. *Three Equal Second Prizes* (£2 each) to Mrs. Eliza Harrison, Anchor Farm, Blubberhouses, near Otley; Mrs. L. R. Mildon, Higher Mead Down, Rackenford, Morechard Bishop; Frank Higgins, Kington, Thornbury. *Three Equal Third Prizes* (£1 each) to Mrs. J. Lewis, Pontantwn Farm, Pontantwn, Kidwelly, Carmarthenshire; Mrs. A. A. Bere, Emmerford Cove, Tiverton; Mrs. John Way, West Bridge, Bishop's Nympton, South Molton, North Devon.

Class 60—BUTTER (slightly salted; 2 lbs. in 1 lb. lumps).—*First Prize* (£3) to Mrs. L. R. Mildon, Higher Mead Down, Rackenford, Morechard Bishop, Devon. *Second Prize* (£2) to Mrs. A. A. Bere, Emmerford Cove, Tiverton, Devon. *Third Prize* (£1) to Mrs. E. A. Peck, Quarry Farm, Moortown, Tavistock.

Class 61—BUTTER (free from salt, or slightly salted, at the discretion of the Exhibitor; to be made from Scalded Cream only; 2 lbs. in 1 lb. lumps).—*First Prize* (£3) to Mrs. Alfred Morrison, Fonthill, Tisbury. *Second Prize* (£2) to Mrs. L. R. Mildon, Higher Mead Down, Rackenford, Morehard Bishop. *Third Prize* (£1) to Mrs. A. A. Bere, Emmerford Cove, Tiverton.

Class 62—FRESH BUTTER (free from salt; in 24 lb. boxes of 12 rolls. Packages (non-returnable) to be taken into consideration. The rolls not to be separately wrapped).—*First Prize* (£5) to Granagh Co-operative Dairy Society, Ltd., Ballingarry, Co. Limerick. *Second Prize* (£3) to Cappamore Co-operative Dairy Society, Cappamore, Co. Limerick. *Third Prize* (£2) to Killeshandra Co-operative Creamery, Killeshandra, Co. Cavan. *Fourth Prize* (£1) to Newcastle West Co-operative Dairy Society, Newcastle West, Co. Limerick. *Fifth Prize* (10s.) to Kilmaleck Co-operative Agricultural and Dairy Society, Ltd., Kilmaleck, Co. Cavan.

Class 63—MILD CURED BUTTER (in boxes of 24 rolls of 1 lb. each, slightly salted. Packages (non-returnable) to be taken into consideration).—*First Prize* (£5) to Bailieborough Co-operative Agricultural and Dairy Society, Co. Cavan, Ireland. *Second Prize* (£3) to Killeshandra Co-operative Creamery, Killeshandra, Co. Cavan. *Third Prize* (£2) to Granagh Co-operative Dairy Society, Ltd., Ballingarry, Co. Limerick. *Fourth Prize* (£1) to Glenwilliam Co-operative Dairy Society, Ltd., Ballingarry, Co. Limerick. *Fifth Prize* (10s.) to Solohead Co-operative Dairy Society, Ltd., Limerick Junction, Tipperary.

Class 64—CURED BUTTER (not less than 28 lbs., slightly salted. Packages (non-returnable) to be taken into consideration).—*First Prize* (£5) to Beltrim Co-operative and Agricultural Society, Ltd., Gostin, Newtown Stewart, Ireland. *Second Prize* (£3) to Solohead Co-operative Dairy Society, Ltd., Limerick Junction, Tipperary. *Third Prize* (£2) to Ballintrillick Co-operative Creamery, Co. Sligo. *Fourth Prize* (£1) to Chas. Prideaux, Dairy Farms, Motcombe, Dorset. *Fifth Prize* (10s.) to Rose Bower Dairy Co., Cashel, Co. Tipperary.

Class 65—CURED BUTTER (56 lbs. packages (non-returnable) to be taken into consideration).—*First Prize* (£5) to Beltrim Co-operative Agricultural and Dairy Society, Ltd., Gostin, Newtown Stewart. *Second Prize* (£3) to Kilmaleck Co-operative Agricultural and Dairy Society, Ltd., Kilmaleck, Co. Cavan. *Third Prize* (£2) to Ballymote Co-operative Agricultural and Dairy Society, Ltd., Ballymote, Co. Sligo. *Fourth Prize* (£1) to Solohead Co-operative Dairy Society, Ltd., Limerick Junction, Tipperary. *Fifth Prize* (10s.) to Rose Bower Dairy Co., Cashel, Co. Tipperary.

Class 66—FANCY OR ORNAMENTAL DESIGN IN BUTTER, with foliage or other extraneous decoration.—*First Prize* (£3) to Mrs. M. M. Giddings, Erchford, Devizes, Wilts. *Second Prize* (£2) to Miss H. M. Trenchard, Uphay Farm, Axminster, Devon.

Class 67—FANCY OR ORNAMENTAL DESIGN IN BUTTER, without extraneous decoration, adapted for table use.—*First Prize* (£3) to Mrs. J. Gooderham, Dairy Farm, North Lopham, Thetford. *Second Prize* (£2) to Mrs. H. M. Trenchard, Uphay Farm, Axminster. *Third Prize* (£1) to Mrs. Carr, Durham Riding Farm, Prudhoe-on-Tyne, Northumberland.

COLONIAL BUTTER.

Class 68—SALT BUTTER (one box, containing not less than 56 lbs.).—*First Prize* (Silver Medal and £5) to Onkaparinga Cheese and Butter Co., Woodside, South Australia. *Second Prize* (Bronze Medal and £3) to Traralgon Butter Factory, Traralgon, Victoria, Australia. *Third Prize* (£2) to Oakey Dairy Co., Oakey, Queensland.

Class 69—FRESH BUTTER (one box, containing not less than 56 lbs.).—*First Prize* (Silver Medal and £5) to Traralgon Butter Factory, Traralgon, Victoria, Australia. *Second Prize* (Bronze Medal and £3) to Framlingham Butter Factory, Framlingham, Victoria, Australia. *Third Prize* (£2) to Goombungee Co-operative Dairy Society, Ltd., Queensland.

CREAM.

Class 70—CLOTTED CREAM (in vessels ready for sale. Not less than 2 lbs. nor more than 3 lbs., in one or more vessels).—*First Prize* (Silver Medal) to J. Dolbear, The Dairy, Newton Abbot. *Second Prize* (Bronze Medal) to Mrs. A. A. Bere, Emmerford Cove, Tiverton, Devon.

Class 71—CREAM, OTHER THAN CLOTTED, in vessels ready for sale. (Not less than 2 lbs. or more than 3 lbs., in one or more vessels).—*First Prize* (Silver Medal) to S. Reece & Sons, Ltd., Hawke Street, Liverpool. *Second Prize* (Bronze Medal) to South Coast Dairy Co., Ltd., The Creamery, Plumpton.

SKIM-MILK BREAD AND SCONES—(MIXED WITH SKIM-MILK IN LIEU OF WATER).

Class 72—WHITE BREAD (2 loaves, not exceeding 2 lbs. each).—*First Prize* (Silver Medal) to A. Ashdown, 97, Crownfield Road, Stratford. *Second Prize* (Bronze Medal) to A. Ashdown.

Class 73—BROWN BREAD (2 loaves, not exceeding 2 lbs. each).—*First Prize* (Silver Medal) to Thomas Batty, Park Bakery, Norfolk Street, Nelson, Lancs. *Second Prize* (Bronze Medal) to J. B. Cox, Gordon Estate Bakery, St. Margarets-on-Thames.

Class 74—FANCY BREAD (not exceeding 4 lbs.).—*First Prize* (Silver Medal) to A. E. Paine, 14, Gunning Street, Plumstead, Kent. *Second Prize* (Bronze Medal) to T. Garner & Co., 31, The Mount, Ipswich.

Class 75—HOME-MADE BREAD (2 loaves, not exceeding 2 lbs. each).—*First Prize* (Silver Medal) to Mrs. Alfred Wearing, 167, Morris Green Lane, Bolton. *Second Prize* (Bronze Medal) to Mrs. H. Pendlebury, Brook Fold Farm, Harwood, near Bolton, Lancs.

Class 76—TWELVE SCONES, baked on Girdle or Plate, any shape, not exceeding 6 ozs. each, without fruit.—*First Prize* (Silver Medal) to F. J. Paine, Dulwich Park Bakery, 375, Lordship Lane, East Dulwich. *Second Prize* (Bronze Medal) to Mrs. Ewings, Blair, Lochans, by Stranraer.

HONEY, &c.

Class 77—TWELVE JARS OF LIGHT-COLOURED EXTRACTED HONEY (1 lb. each approximate weight).—*First Prize* (£1) to Samuel Cartwright, Shawbury, Shrewsbury. *Second Prize* (15s.) to J. Boyes, Queen's Head Hotel, Bridge Street, Cardiff. *Third Prize* (12s. 6d.) to James Lee & Son, Ltd., The Apiary, Fulbourn, Cambs. *Fourth Prize* (10s.) to T. G. Hillier, Hurstbourne Tarrant, Andover, Hants.

Class 78—TWELVE JARS OF MEDIUM-COLOURED EXTRACTED HONEY (other than Heather Honey), 1 lb. each approximate weight).—*First Prize* (£1) to F. W. Frusher, Swiss Apiary, New Road, Crowland, Peterborough. *Second Prize* (15s.) to R. H. Baynes & Co., 51, Bridge Street, Cambridge. *Third Prize* (12s. 6d.) to James Lee & Son, Ltd., The Apiary, Fulbourn, Cambs. *Fourth Prize* (10s.) to Mrs. E. Seadon, The Apiary, Bromley, Kent.

- Class 79—TWELVE JARS OF DARK-COLOURED EXTRACTED HONEY, including any variety of Heather mixture (1 lb. each approximate weight).—*First Prize* (15s.) to J. Southwell, Holbury Mill, Lockerley, Romsey. *Second Prize* (10s.) to F. W. Frusher, Swiss Apiary, New Road, Crowland, Peterborough.
- Class 80—TWELVE JARS OF RUN (*Ling. Caluma Vulgaris*) HEATHER HONEY (1 lb. each approximate weight).—*First Prize* (15s.) to Tom Sleight, Old Dunesmoor, Chesterfield.
- Class 81—TWELVE JARS OF GRANULATED HONEY OF 1907, or any previous year (1 lb. each approximate weight).—*First Prize* (£1) to George Deller, Chrishall Grange, Royston.
- Class 82—TWELVE SECTIONS OF HONEY, OTHER THAN HEATHER (size 4½ by 4½; 1 lb. each approximate weight).—*First Prize* (£1) to Richard Brown and Son, Flora Apiaries, Somersham, Hunts. *Second Prize* (15s.) to James Lee & Son, Ltd., The Apiary, Fulbourn, Cambs. *Third Prize* (10s.) to T. G. Hillier, Hurstbourne Tarrant, Andover, Hunts.
- Class 83—SIX SECTIONS OF HEATHER HONEY (1 lb. each approximate weight).—*First Prize* (£1) to Joseph G. Nicholson, Langwathby, R.S.O., Cumberland.
- Class 84—DISPLAY OF COMB AND EXTRACTED HONEY, of any year (approximately 100 lbs. in weight, shown on a space of 3 feet by 3 feet).—*First Prize* (£2) to Richard Brown & Son, Flora Apiaries, Somersham, Hunts. *Second Prize* (£1 5s.) to James Lee & Son, Ltd., The Apiary, Fulbourn, Cambs.
- Class 85—WAX (not less than 2 lbs., in 2 cakes only; the Produce of the Exhibitor's Apiary; extracted and cleaned by the Exhibitor or his assistants).—*First Prize* (15s.) to E. C. R. White, Manor Farm, Newton Toney, Salisbury. *Second Prize* (10s.) to F. W. Frusher, New Road, Crowland, Peterborough.
- Class 86—WAX (not less than 3 lbs.; the produce of the Exhibitor's Apiary; extracted and cleaned by the Exhibitor or his assistants; to be shown in shape, quality, and package suitable for the retail trade).—*First Prize* (15s.) to J. Pearman, Penny Long Lane, Derby. *Second Prize* (10s.) to C. W. Dyer, Compton, near Newbury, Berks.
- Class 87—INTERESTING AND INSTRUCTIVE EXHIBIT OF A PRACTICAL OR SCIENTIFIC NATURE, connected with Bee Culture, not mentioned in the foregoing Classes.—*First Prize* (15s.) to Geo. Hayes, Melhurst, Mona Street, Beeston, Notts.

ROOTS, &c.

- Class 88—SIX SPECIMENS OF LONG MANGOLDS, drawn from a crop of not less than two acres.—*First Prize* (£3) to Frank Horne, Salter's Hall, Bobbington, Stourbridge. *Second Prize* (£2) to Abraham Gregory, Eastcroft Farm, Saughton, Chester. *Third Prize* (£1) to P. le Fèvre, Morville House, St. Owen's, Jersey.
- Class 89—SIX SPECIMENS OF GLOBE MANGOLDS, drawn from a crop of not less than two acres.—*First Prize* (£3) to Leonard J. Smith, The Scarr Farm, Newent, Glos. *Second Prize* (£2) to Frank Hargreaves, Merton Grange, Gamlingay. *Third Prize* (£1) to Frank Horne, Salter's Hall, Bobbington, Stourbridge.
- Class 90—SIX SPECIMENS OF GOLDEN OR CRIMSON TANKARD MANGOLDS, drawn from a crop of not less than two acres.—*First Prize* (£3) to Lady Wantage, Lockinge House, Wantage. *Second Prize* (£2) to T. Chettle, Manor Farm, Reading. *Third Prize* (£1) to Percy E. Mead, Gubblecott, Tring.
- Class 91—SIX SPECIMENS OF INTERMEDIATE MANGOLDS, drawn from a crop of not less than two acres.—*First Prize* (£3) to Lady Wantage, Lockinge

House, Wantage. *Second Prize* (£2) to T. Chettle, Manor Farm, Reading. *Third Prize* (£1) to G. Hawes, Worminghall, Thame.

Class 92—SIX SPECIMENS OF SWEDS, any variety, drawn from a crop of not less than two acres.—*First Prize* (£3) to Mrs. C. McIntosh, Havering Park, Romford. *Second Prize* (£2) to G. Roger Evans, Tanllan, Taliesin, Glandyfi, S.O., Cardiganshire. *Third Prize* (£1) to James Weir, Braughing, Ware.

Class 93—COLLECTION OF ROOTS, &c., for Cattle Feeding in Winter.—To consist of Six Specimens of as many as possible of the following: Mangolds, Swedes, Turnips, White Carrots, Red Carrots, Potatoes, Beetroot, Kale, Kohl-Rabi, Parsnips, and Cabbages.—*First Prize* (£5) to Mrs. C. McIntosh, Havering Park, Romford. *Second Prize* (£3) to Lady Wantage, Lockinge House, Wantage. *Third Prize* (£2) to Percy E. Mead, Gubblecott, Tring.

INVENTIONS, &c.

Class 94—RAILWAY CHURN, capable of containing 17 Imperial gallons. One Churn to be shown whole and one in Sections. Competitors will be required to give an undertaking to execute at the price scheduled all orders within three months of the opening of the Show. Prizes awarded will be withheld for the period stated.—*First Prize* (Gold Medal) to Vipam & Headley, Leicester, for "Railway Churn, No. A1." *Second Prize* (Silver Medal) to Thos. Harrison, Waverley Creamery, C.-on-M., Manchester, for "Sanitary Railway Churn." *Third Prize* (Bronze Medal) to Vipam & Headley for "Railway Churn, No. 2."

Class 95—ANY NEW INVENTION relating to the Dairy Industry, or one showing distinct and practical improvement, not eligible for competition in any other Class, and not previously exhibited at the Dairy Show.—*Prizes*.—The Judges are empowered to award a Silver or Bronze Medal to any Exhibitor showing sufficient merit. The Judges shall have the right to submit any exhibit to a practical test, or to call upon the Exhibitor to make such test in their presence, before making an award.—*Silver Medal* to The Dairy Supply Co., Ltd., Museum Street, W.C., for "New Model 'Alfa Laval' A 11 Cream Separator." *Silver Medal* to Waide & Sons, Ltd., City Churn Works, Leeds, for "Improved End-over-End Churn Lid Fastening." *Silver Medal* to Moeller & Condrup, Ltd., 78, Fore Street, London, E.C., for "Cream Separator for Hand-power 'Printis' C." *Silver Medal* to Martin's Cultivator Co., Ltd., Lincolnshire Iron Works, Stamford, for "Martin's Patent Side-delivery Rake." *Silver Medal* to Bergedorfer Eisenwerk Aktiengesellschaft, for "Astra Milk-cooling Cylinder." *Bronze Medal* to Burmeister & Wain, Ltd., Middle Abbey Street, Dublin, for "Cleaner and Separator 'Giant.'" *Bronze Medal* to The Wilts United Dairies, Ltd., Devizes, for "Condensed Milk Tin." *Bronze Medal* to Pond & Sons, Prize Dairy Works, Blandford, for "Cheese Vat." *Bronze Medal* to Thomas Grayson, 16 and 17, Queen Street, Derby, for "Milk Refrigerator with Safety Air-tube." *Bronze Medal* to The Dairy Supply Co., Ltd., for "Dr. N. Gerber's Tester for Dirt in Milk."

BUTTER-MAKING CONTESTS.

Class 96—Open to those who have never won a prize at any Show, wherever held.—*First Prize* (£3) to Offord D. Carter, Great Seabrights, Galleywood. *Second Prize* (£2) to Miss Sheila Murphy, Munster Dairy Institute, Cork. *Third Prize* (£1) to Miss F. E. Watkins, Deepholm, Monmouth.

Class 97—Open to Students who have attended at the British Dairy Institute, Reading, for not less than one month during the past two years.—*First Prize* (£3) to Miss Alice Jones, Newton Farm, Cowbridge, Glam. *Second Prize* (£2) to Miss K. L. Perrett, Charlcombe Bath. *Third Prize* (£1) to Philip Crowley, 49, Queen's Road, Reading.

- Class 98—Section A.—Open to Women only.—*First Prize* (£3) to Miss C. L. Neavey, Hygienic Dairy, Stanmore. *Second Prize* (£2) to Miss Francis S. Cox, Pwllpen, Christchurch, Newport, Mon. *Third Prize* (£1) to Miss E. M. Powell, Ballingham Court, Holme Lacy, Hereford.
- Class 98—Section B.—*First Prize* (£3) to Miss May Cambray, Baunton Farm, Cirencester. *Second Prize* (£2) to Miss Annie Prichard, Village Farm, Upton Warren, near Bromsgrove. *Third Prize* (£1) to Miss Mary Dalrymple, Elliston, St. Boswells, N.B.
- Class 98—Section C.—*First Prize* (£3) to Miss Emma J. Hockley, Cooper's Farm, Takeley, Essex. *Second Prize* (£2) to Miss Rosa Davies, Manor Farm, Cadnam, Southampton. *Third Prize* (£1) to Miss Sheila Murphy, Munster Dairy Institute, Cork.
- Class 99—Section A.—Open to Men and Women.—*First Prize* (£3) to Miss Mary Dalrymple, Elliston, St. Boswells, N.B. *Second Prize* (£2) to Miss Mary Jenkins, The Church Farm, Oddingley, Droitwich, Worcester. *Third Prize* (£1) to Miss J. Watt-White, Wolves & Joyes' Farm, Romford, Essex.
- Class 99—Section B.—*First Prize* (£3) to Miss M. A. Chinery, Dairy School, County Laboratories, Chelmsford. *Second Prize* (£2) to Miss M. P. Comer, Fanshaw's Farm, Hertford. *Third Prize* (£1) to Miss K. L. Perrett, Charlcombe, Bath, Somerset.
- Class 99—Section C.—*First Prize* (£3) to Miss A. Gerrard, Huddington, Droitwich. *Second Prize* (£2) to H. S. Briggs, Thornielaw, St. Boswells. *Third Prize* (£1) to Miss Lillie Cook, Ashford Farm, Ashford, Middlesex.
- Class 100—Open to First Prize Dairy Show Winners of 1908.—*First Prize* (£3) to Miss May Cambray, Baunton Farm, Cirencester. *Second Prize* (£2) to Miss Mary Dalrymple, Elliston, St. Boswells, N.B. *Third Prize* (£1) to Offord D. Carter, Great Scabrights, Galleywood.
- Class 101—Champion Contest.—Open to winners of First Prizes in the preceding classes, or at the Dairy Show of 1907. Champions of any year accepted.—*First Prize* (Lord Mayor's Champion Cup and £5, and winner of the Dairy Students' Union Silver Plate, value £3 3s.) to Miss A. Gerrard, Huddington, Droitwich. *Second Prize* (£3) to Miss Isa White, Wolves and Joyes' Farm, Romford. *Third Prize* (£2) to Miss Mary Dalrymple, Elliston, St. Boswells.

MILKERS' CONTESTS.

- Class 102—Open to Men over 18.—*First Prize* (£5) to Wm. Greive, Oyedall Farm, Gilston, Harlow, Essex. *Second Prize* (£3) to John Wilcock, Hazelrigg, Gulgate, Lancaster. *Third Prize* (£2) to Geo. B. Nelson, Cockerham Hall, near Garstang.
- Class 103—Open to Boys under 18.—*First Prize* (£5) to J. Mathers, Burton, near Lincoln. *Second Prize* (£3) to William Hawkins, Sandling Farm, Sandling, Maidstone. *Third Prize* (£2) to George Randall, Bower Farm, Havering Park, Romford.
- Class 104—Open to Women over 18.—*First Prize* (£10) to Miss J. Nisbet, Lordship, Hinxton, Saffron Walden. *Second Prize* (£7) to Miss Nellie Duerden, Mearley Hall, Clitheroe, Lanes. *Third Prize* (£5) to Mrs. W. H. Purnell, Broadfield, Wrington, near Bristol. *Fourth Prize* (£3) to Miss Sarah Nelson, Cockerham Hall, near Garstang. *Fifth Prize* (£2) to Miss E. Masson, The Dairy Cottage, Floors Castle, Kelso, N.B.
- Class 105—Open to Girls under 18.—*First Prize* (£5) to Miss E. M. Edwards, Pantysgawen Farm, Newbridge, Mon. *Second Prize* (£3) to Miss R. J. Masson, Attimore Hall, Hatfield. *Third Prize* (£2) to Miss Margaret Nisbet, Lordship, Hinxton, Saffron Walden.

BRITISH DAIRY FARMERS' ASSOCIATION.

Report of the Council, presented to the General Meeting of Members,
October 7th, 1908.

The Council, in presenting their Half-yearly Report, have to record the great loss sustained by the Association by the lamented death of the Earl of Derby in June last, who so ably filled the office of President in 1895, since when he occupied the position of Vice-President, and always took a lively interest in all that pertained to the welfare of the Association.

The increasing magnitude of the Dairy Show, as evidenced by the following table, is to the Council a source of extreme satisfaction, the total number of exhibits this year being far in excess of those at any previous show.

Comparative Statement of Dairy Show Entries.

	1903.	1904.	1905.	1906.	1907.	1908.
Cattle	203	164	182	240	237	247
Milking and Butter Tests ..	186	167	217	247	245	224
Goats	30	46	51	51	48	72
Poultry	2,860	2,678	3,068	3,347	3,081	3,280
Pigeons	2,485	2,426	2,440	2,573	2,664	2,564
Poultry and Pigeon Appliances.	—	—	—	55	65	50
British Cheese	269	250	268	255	420	357
Bacon and Hams	79	46	49	39	57	76
Butter	555	556	641	578	593	668
Cream	59	44	52	42	35	47
Skim-Milk Bread, &c.	83	140	121	159	118	135
Honey, &c.	125	122	124	118	67	85
Egg and Butter Packages ..	17	20	—	—	—	—
New and Improved Inventions.	24	43	22	17	33	37
Vehicles for Conveying Milk ..	27	25	—	—	—	—
Roots	144	184	170	156	177	181
Butter-Making Contests	150	172	206	199	200	207
Milkers' Contests	36	55	66	121	135	132
	7,332	7,138	7,677	8,197	8,175	8,362

With the new Gilbey Hall at the disposal of the Council for the first time, they have been able to place before members and visitors an exhibition more worthy of the great and important industry which the Association constantly aim to promote by every means available. One of these is the Conference held usually in June, this year in Derbyshire and Staffordshire, under the Presidency of Sir George Barham, J.P., when a large number of delegates from kindred Societies joined the Association to discuss matters of import to the dairy industry, viz., "Legislation affecting Milk Production," and the source, prevention and cure of diseases stated to arise out of the use of this most important of all foods.

The following resolutions were passed unanimously and forwarded to the President of the Local Government Board and President of the Board of Agriculture, viz. :—

- (1) "That the enforcement of any new regulations in respect of farms and farm buildings should be in the hands of the Board of Agriculture."
- (2) "That in view of the fact that the regulations about to be imposed upon the producers in this country cannot be enforced in the case of milk produced in foreign countries, the importation of such milk should be prohibited."
- (3) "That in order to secure the co-operation of the owners of stock, full compensation be paid for all animals compulsorily slaughtered, on the basis of the declared value before slaughter, such compensation to be paid out of the Imperial Funds."
- (4) "That as it has been shown that a large percentage of infantile mortality is due to insufficient nourishment arising from the use of condensed skimmed milk, it is desirable that a standard should be fixed by the Board of Agriculture for condensed milk."
- (5) "That all condensed milk which in its preparation has been skimmed, separated, or deprived of any portion of its butter fat should be marked in large letters 'UNFIT FOR THE FOOD OF INFANTS.'"
- (6) "That in view of the many mis-statements which have been published in connection with infantile mortality in its relation to the milk supply, this Conference is of opinion that the attention of the public should be drawn to the fact that infantile mortality is greatest where the consumption of fresh cows' milk is smallest."
- (7) "That this Conference considers the fixing of a definite air space in cow sheds both unscientific and unpractical. If such definite air space is demanded, this Dairy Conference is in accord with the resolution passed at the International Congress of Dairying at the Hague in 1907, that such limit should only apply to sheds built after the passing of the regulation."
- (8) "That whatever standard of cleanliness may be deemed necessary for milk, such standard should be fixed for the whole country by the Local Government Board and not left to the discretion of local authorities."
- (9) "That representations be made to the Board of Agriculture with a view to securing the provision of a supply of tuberculin of guaranteed strength to Veterinary Surgeons for the use of farmers and owners of cattle free of charge."

Another matter which the Council have recently had under consideration is the renewed agitation to promote the importation of Store Cattle from abroad. This matter was very carefully discussed, and the following resolution was passed and forwarded to the President of the Board of Agriculture, viz. :—

"That this Council view with anxiety the renewed agitation for the re-admission of foreign live cattle into this country, and desire to impress upon the Board of Agriculture the importance of continuing their present attitude in regard to such importations."

In accordance with the terms of the Articles of Association, the following Members of the Council retire this year, all of whom, except Mr. W. P. Vosper, offer themselves for re-election.

BELL, GEO. J.	READ, BENJAMIN
GRANT, W. J.	ROSS, JOHN H.
LONG, ROBERT	VILLAR, SIDNEY
MIDDLETON, CHRISTOPHER	VOSPER, W. P.
NUTTALL, Professor T.	WALLIS, HARRY
PEGLER, A. S. HOLMES	

The following new Candidates have been nominated :--

NAME AND ADDRESS OF MEMBER.

BENSON, JOHN, The Dairy, Dale Road, Buxton.
FARMER, JOHN THOS. H., Langstone, Moretonhampstead, Devon.
KIRBY, JAMES, Farley House, Boreham Wood, Herts.
NELSON, GEO. B., Cockerham Hall, Garstang, Lancs.
NISSBET, WILLIAM, Lordship, Hinxton, Saffron Walden.
ROBINSON, CHAS., Tollesby, Marton, R.S.O., Yorks.

The results of the voting will be announced at a later stage of the present Meeting.

The Council regret the continued illness of the Secretary (Mr. Wm. C. Young) whose energy and experience at previous Shows has been of so much value, and they hope that with rest and freedom from anxiety he may soon be restored to health and able to resume his duties.

By Order of the Council,

FREDERICK E. HARDCASTLE,

Acting Secretary.

•Thirty-Third Annual Report of the Council to the General Meeting

of Members, Wednesday, March 3rd, 1909.

The Council have pleasure in submitting the Thirty-third Annual Report of the Society, and in so doing have the pleasure of recording that the Association has well maintained its position and usefulness. The Society now consists of 970 Annual and 74 Life Members, making a total of 1,044, compared with 1,019 at the corresponding time last year.

With deep regret the Council have to record the loss of their late colleague, Mr. THOMAS STONE, who had long been an active worker in the affairs of the Association. The vacancy thus caused has been filled by the election of Mr. H. R. HOWMAN (Glos.). Other changes effected by the votes of members are the election of

Mr. JOHN BENSON (Derbyshire), Mr. JAMES KIRBY (Hertfordshire), and Mr. WILLIAM NISBET (Cambs.), in the place of three retiring members.

The Society's investments have been increased by the purchase of £200 London and South Western Railway 3 per cent. Debentures, so that the invested funds now amount to £2,794 10s. 9d. The financial year closed with a balance in hand of £593.

In the summer a most successful conference was held in the Midlands (Derbyshire and Staffordshire), when, in addition to 77 Members of the Association, there were present 43 delegates from 25 kindred Societies. The papers and discussions were confined to questions connected with contemplated legislation affecting the production and sale of milk, and a number of important resolutions bearing thereon were ordered to be forwarded to the Local Government Board and the Board of Agriculture.

Cheshire, which was the scene of the Society's Conference in 1885, has been selected for the Conference of 1909, and the programme is now under consideration.

The entries at the Annual Dairy Show—the thirty-third of the series—again showed a distinct advance on preceding years. A re-arrangement of the exhibits was rendered possible by the use of the New Gilbey Hall, a considerable enlargement of the Minor Hall. The Show was well attended on the part of the public, and the Council are pleased to record that the finances show a balance of £434.

A large number of students continue to be received at the British Dairy Institute, Reading, towards the cost of which the Government have once more made a grant of £300. The present building will shortly have to be given up, having been acquired by the Town Council, and a new building is in course of erection by the University College.

Two Examinations for the Society's Diplomas and Certificates were held at the Institute during 1908, and one at Chelmsford in connection with the Essex County Council. The following awards resulted :—

- 7 Diplomas for proficiency in the science and practice of Dairy Farming and Dairying.
- 3 Teachers' Certificates.
- 2 Certificates of proficiency in the principles and practice of butter and Cheddar cheese making.
- 8 Certificates of proficiency in the principles and practice of Cheddar cheese making.
- 11 Certificates of proficiency in the principles and practice of butter-making.

The Council, having considered the Report of the Departmental Committee on Agricultural Education, are thoroughly convinced that the Government support now given towards Agricultural Education and Research in England and Wales is entirely inadequate, even when compared only with Scotland and Ireland. The Council have therefore asked the Chancellor of the Exchequer to give his most favourable consideration to the Committee's Report, and to grant annually to the Board of Agriculture for the purposes of Education such sum as will enable the Board to place both Agricultural Education and Research in this country on at least an equal footing with that of other countries whose agricultural produce competes in our market.

A number of milk clauses have been again included in the London County Council General Powers Bill. The Council reiterate their strong objection to the inclusion in any Private Bill of proposals affecting the dairy industry which are outside the provisions of the Model Milk Clauses incorporated in various local Acts from 1899 onwards. Further, in view of the Government's promise, in the King's Speech at the opening of the present Session of Parliament, to introduce a Bill, applicable to the whole country, dealing with the subject of milk production and distribution, they take exception to any further attempts at piecemeal legislation.

The Council have had under consideration the 'Third Interim Report of the Royal Commission on Tuberculosis. They consider that the statement in that report that tuberculosis involving the udder is comparatively common in cows, is at variance with all the ascertained facts regarding the prevalence of the disease.

By Order of the Council,

WILLIAM C. YOUNG,

Secretary.

FINANCIAL STATEMENT—continued.

£	s.	d.	£	s.	d.	£	s.
d.							d.
DAIRY SHOW, 1908:—							
Entry Fees, Competitive and Non-Competitive	4,474	18	6	..	..	30	6
Catalogue Sales and Advertisements	298	12	0	..	..	2,756	17
Admission Money	1,785	3	6	..	..	701	10
Sales of Exhibits	875	5	8	..	..	..	9
Sales in Working Dairies, &c.	175	16	10	..	..	..	..
Contributions to Prize Fund	105	19	6	..	..	£189	0
Miscellaneous	4	7	0	..	..	0	10
	7,720	3	0			Do.	9
			8,976	16	9	Labourers	121
						..	7
DAIRY SHOW, 1908:—							
Entry Fees returned	..	..	..	..	..	310	8
Prizes to Exhibitors	..	..	..	..	..	223	18
Sales of Exhibits	..	..	..	..	..	359	8
Wages: Clerks and Assistants	£189	0	10	..	..	445	0
Do.	121	7	9	..	..	612	13
..	..	..	..	..	..	64	16
Printing and Stationery	..	..	..	..	..	73	10
Advertising	..	..	..	..	..	458	17
Rent of Royal Agricultural Hall	..	..	..	..	..	163	16
Fittings, &c.	..	..	..	..	..	75	5
Forage (Hay, Straw, &c.)	..	..	..	..	..	182	4
Band	..	..	..	..	..	184	12
Judges and Stewards' Fees	..	..	..	..	..	225	1
Refreshments	..	..	..	..	..	73	14
Postage	..	..	..	..	..	29	0
Working Dairies, Milk, Cream, Ice, &c.	..	..	..	..	..	34	15
Light, Water, &c.	..	..	..	..	..	57	14
Catalogue	..	..	..	..	..	23	1
Police	..	..	..	..	..	13	0
Turnstiles	..	..	..	..	..	31	17
Steam	..	..	..	..	..	..	6
Signs, Headboards, &c.	..	..	..	..	..	..	..
Decorations	..	..	..	..	..	..	..
Clearing Hall	..	..	..	..	..	..	..
Analyses	..	..	..	..	..	..	..
Miscellaneous Expenses: Insurance, Auctioneer, Badges, Rosettes, Lodgings, Baskets, Boxes, Bankers' Charges, and Sundries	..	..	..	..	..	170	6
						11	
Balance at Bank and Cash in hand	..	..	..	..	..	7,301	15
						593	18
						5	
						£9,641	9
						8	

£9,641 9 8

THE British Dairy Farmers' Association.

Patron—HIS MAJESTY THE KING.

President (1909)—LORD BELPER.

OBJECTS AND ADVANTAGES.

The objects of the Association are the improvement of

DAIRY STOCK AND DAIRY PRODUCE,

by encouraging the Breeding and Rearing of Stock for the special purpose of the Dairy; a larger and more general production of Butter, Cheese, and Eggs; the Erection of Improved Dairy Buildings, and the Invention of New or Improved Dairy Utensils, Machinery, Implements, and Scientific Appliances. The Association also stimulates the Breeding and Rearing of Poultry, &c. By means of papers in the Society's *Journal* (published annually), Annual Conferences in different dairy districts, Lectures and Discussions, and in other ways, efforts are continually being made to disseminate a more thorough knowledge of Dairy husbandry.

Prizes to the value of upwards of £2,000 are annually offered for competition at the Dairy Show held at the Royal Agricultural Hall, Islington, London.

It is difficult to over estimate the importance and need of greater attention being paid to the Dairy industry. It is admitted that by improved modes of managing Milk and its products, the wealth obtained from the Milch Cows of the country could be increased most materially. The Council therefore appeal to Agriculturists of all classes, and Dairy Farmers in particular, who, by becoming Members of the Association, will practically aid in developing its usefulness.

The advantages of Membership comprise :—

- 1.—A free pass to all the Society's Dairy Shows, available each day during the Exhibition, with the privilege of admitting free (by ticket) a friend on any one day.
- 2.—The Exhibition of Live Stock, Dairy Produce, and Utensils at a reduced scale of fees.
- 3.—A copy (free by post) of the *Journal* of the Association, published annually; price 1s. to non-Members.

- 4.—Analyses by the Analytical and Consulting Chemist, at low fees, of samples of milk, cream, butter, cheese, feeding stuffs, water, soil, manures, etc., and advice on dairy matters connected with his Department.
- 5.—Professional advice and assistance at a reduced scale of charges in any case of disease among the live stock of the farm.
- 6.—Examinations of plants and seeds by the Consulting Botanist on specially low terms.
- 7.—Examinations by the Consulting Pathological Bacteriologist for particular pathogenic or disease-producing organisms.
- 8.—Investigations by the Consulting Dairy Bacteriologist into the cause of trouble or taints in dairy produce.

The annual Subscription is £1, but Dairy Instructors and *bona-fide* Tenant Farmers are admitted on payment of 10s. 6d. per annum. The latter sum entitles the Member to all privileges, except the reduced fees for exhibition at the Shows. A *bona-fide* Tenant Farmer is deemed to be one who rents the whole of the land in his occupation.

MEMBERS' VETERINARY PRIVILEGES.

Members of the Association who require professional assistance in any case of disease among their animals must apply direct to the Consulting Veterinary Surgeon, Mr. SIDNEY VILLAR, F.R.C.V.S., Harrow, Middlesex, whose scale of charge is as follows:—

	£	s.	d.
Personal Consultation	0	10	6
Post-mortem Examination and Report	0	10	6
Consultation by Letter	0	5	0
Visit and Report, in case of an outbreak of disease, in addition to personal and travelling expenses, per day	2	2	0

MEMBERS' BOTANICAL PRIVILEGES.

The Council have fixed the following rates of charge for the examination of Plants and Seeds for the *bona-fide* and individual use and information of Members of the Association (not being Seedsmen), who are particularly requested, when applying to the Consulting Botanist, to mention the kind of examination they require, and to quote its number in the subjoined Schedule.

No.	£	s.	d.
1.—A Report on the purity, and amount of nature of foreign materials, of a sample of seed	0	1	0
2.—A Report on the perfectness and germinating power of a sample of seed	0	1	0
Nos. 1 and 2 together	0	1	6
3.—Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means for its extermination or prevention	0	1	0
4.—Report on any disease affecting farm crops	0	1	0
5.—Determination of the species of a collection of natural grasses found in any district, with a report on their habits and pasture value	0	4	0

Instructions for Selecting and Sending Samples.

The utmost care must be taken to secure a fair honest sample. When possible, at least one ounce of grass and other small seeds should be sent, and two ounces of cereals or larger seeds. Grass seeds should be sent at least four weeks, and clover seeds two weeks before they are to be used. In collecting specimens of plants, the whole plant should be taken up, and the earth shaken from the roots. If possible, the plant must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel. Specimens of diseased plants or of parasites should be forwarded as fresh as possible—either in a bottle, or packed in tinfoil or oil silk. All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstance (soil, situation, etc.) which, in the opinion of the sender, would be likely to throw light on the inquiry. Parcels or letters containing seeds or plants for examination must be addressed to the Consulting Botanist, Professor John Percival, M.A., University College, Reading.

The charge for examination must be paid, in Postage Stamps or otherwise, at the time of application, and the carriage of all parcels must be prepaid. It must be distinctly understood that *no notice can be taken* of any application unless it is accompanied by the proper fee.

MEMBERS' CHEMICAL PRIVILEGES.

MILK (Fresh).						£	s.	d.
Estimation of Fat and Total Solids	..	..	..	..	..	0	2	6
Estimation of Fat, Casein, Albumin, Sugar, and Ash	..				..	0	10	6
MILK (Sour).								
Estimation of Fat and Total Solids	..	..	..	..	..	0	5	0
SKIMMED MILK.								
Estimation of Fat and Total Solids	..	..	..	..	..	0	5	0
CONDENSED MILK.								
Estimation of Fat	..	..	..	..	..	0	5	0
Estimation of Fat, Casein, and Solids	..	..	..	..	..	0	10	6
Estimation of Cane Sugar	..	..	..	..	..	0	5	0
HUMANISED MILK.								
Complete Analysis..	..	..	..	..	..	1	1	0
CREAM.								
Estimation of Fat	..	..	..	..	..	0	5	0
Estimation of Fat, Casein, and Solids	..	..	..	..	..	0	10	6
Examination for Foreign Fats	..	..	..	..	..	0	10	6
BUTTER. •								
Estimation of Water, Casein, and Ash	..	..	..	..	..	0	5	0
Examination for Foreign Fats	..	..	..	..	..	0	10	6

						£	s.	d.
CHEESE.								
Estimation of Water, Fat, and Casein .. .. .	..	..	..	..	..	0	5	0
Examination for Foreign Fats .. .. .	..	..	..	..	..	0	10	6
RENNET.								
Examination of Strength.. .. .	..	..	..	..	..	0	5	0
CAKES AND MEALS.								
Estimation of Oil only .. .. .	..	..	..	..	..	0	5	0
Estimation of Oil, Albuminoids, and Carbo-hydrates ..	..	..	..	..	..	0	10	6
GRASS, SILAGE, ROOTS, &c.								
Estimation of Oil, Albuminoids, and Carbo-hydrates, &c. ..	..	..	..	..	..	1	1	0
MANURES.								
Estimation of Phosphoric Acid .. .. .	..	..	..	..	..	0	5	0
Estimation of Soluble and Insoluble Phosphoric Acid ..	..	..	..	..	..	0	7	6
Estimation of Nitrogen .. .. .	..	..	..	..	..	0	5	0
Estimation of Potash .. .. .	..	..	..	..	..	0	5	0
SOIL.								
Estimation of Lime .. .. .	..	..	..	..	..	0	5	0
Analysis and Report .. .. .	..	..	..	..	..	2	2	0
WATER.								
Analysis for Drinking or Dairy Purposes .. .. .	..	..	..	..	..	1	1	0
POISONS.								
Examination of a Substance for Mineral Poisons .. ..	..	..	..	..	..	2	2	0
Examination for Organic Poisons (Alkaloids, &c.) .. ..	..	..	..	..	..	3	3	0
CIDER AND FERMENTED DRINKS.								
Estimation of Alcohol .. .. .	..	..	..	..	..	0	5	0
Estimation of Alcohol, Sugar, Acidity, &c. .. .. .	..	..	..	..	..	0	10	6
PRESERVATIVES.								
Examining a Substance for Boracic Acid or Salicylic Acid, &c., for each Substance sought .. .. .	..	..	..	..	..	0	2	6
Estimation of the quantity of Boracic Acid .. .. .	..	..	..	..	..	0	10	6
Analysis of a Preservative .. .. .	..	..	..	..	..	1	1	0
COLOURING MATTER.								
Examination for Artificial Colouring .. .. .	..	..	..	..	..	0	5	0
CONSULTATION.								
For letter in reply to Enquiry .. .. .	..	..	..	..	..	0	5	0
For Personal Interview .. .. .	..	..	..	..	..	0	5	0
For Special Consultation .. .. .	..	..	..	..	..	1	1	0

NOTE.—The Consulting Chemist will be prepared to quote reduced terms to Members requiring a number of analyses at frequent intervals.

Instructions for Taking Fair Samples for Analysis.

Dairy Produce.—Milk should be sent in a well-corked 8oz. clear bottle. The milk should quite fill the bottle. Butter or Cheese, about 8 ounces; the former in a gallipot, well tied down.

Soils.—A block of soil about four or five inches square, and nine inches deep, should be sent in a strong box by rail.

Artificial Manures.—Take a handful of manure out of at least half a dozen bags, mix these rapidly and thoroughly, breaking down all lumps. Forward about a pound of the mixture in a tin box, and retain the remainder. Samples of manure should be sent immediately after the delivery of the bulk, and before settling the account. All manures should be bought subject to analysis.

Feeding Materials.—Feeding cakes, meals, or grains: About a pound should be sent in a bag or box. Grass and hay: A bundle of a few pounds weight. Silage: A six-inch cubic block, packed closely in a box to keep it compressed.

Waters.—A Winchester quart glass-stoppered bottle should be procured from a druggist, well washed out with water, then completely filled, the stopper tied securely down, and the bottle packed in a box and sent by rail.

N.B.—In order to prevent disappointment, the Chemist requests that, as far as possible, Members desiring to hold a personal consultation should make an appointment by letter. Between 12 and 3 are the hours most convenient. The fees for analyses of artificial manures and feeding stuffs are payable in advance, and only applicable to Members who are not commercially engaged in the manufacture or sale of the articles sent for analysis. All communications intended for the Analytical and Consulting Chemist must be addressed direct to F. J. Lloyd, F.C.S., Agricultural Laboratory, Muscovy House, 6, Trinity Square, London, E.C.

MEMBERS' BACTERIOLOGICAL PRIVILEGES.

EXAMINATIONS BY DR. ANDREWES, Pathological Laboratory,
St. Bartholomew's Hospital, London, E.C.

MILK.	£	s.	d.
Cultural and experimental examination for a particular pathogenic organism	2	2	0
PASTEURISED OR STERILISED MILK.			
Cultural and experimental examination for a particular pathogenic organism	1	1	0
CREAM, BUTTER, OR CHEESE.			
Cultural and experimental examination for a particular pathogenic organism	2	2	0
WATER.			
Cultural and experimental examination for a particular pathogenic organism	2	2	0

INVESTIGATIONS BY MR. F. J. LLOYD, F.C.S., Muscovy House,
6, Trinity Square, London, E.C., INTO THE CAUSES OF TROUBLE OR
TAINTS IN MILK, CREAM, BUTTER, OR CHEESE.

MILK.	£	s.	d.
Microscopical and cultural examination for a particular organism	2	2	0
Experimental and cultural examination for a particular organism	£5	5	0 to 10 10 0
CREAM, BUTTER, CHEESE.			
Microscopical examination	0	10	6
Microscopical and cultural examination	2	2	0
PASTEURISED OR STERILISED MILK.			
Microscopical examination for bacteria.. .. .	0	5	0
Estimating number of bacteria present	0	10	6
Culture examination of bacteria present	2	2	0

Directions for Sending Samples.

Samples of milk or water (one quart) and cream (half-pint) should be forwarded in wide-mouthed stoppered bottles which have previously been thoroughly cleaned, and then rinsed several times with very hot, almost boiling, water.

Butter is best sent in a $\frac{1}{2}$ lb. brick or roll, just as it was made up, wrapped in grease-proof paper, and packed in a box.

If the *Cheese* is small, send a whole one; otherwise, forward a square block of not less than one pound, and not a wedge-shaped piece. Wrap in grease-proof paper, and pack in a box.

All samples should be sent by the speediest method possible. They ought not to arrive either on Saturday or Sunday.

Samples to be examined for disease-producing organisms should be forwarded to Dr. Andrewes, Pathological Laboratory, St. Bartholomew's Hospital, London, E.C. Members are requested to note that in the case of examination for the tubercle bacillus the method of animal inoculation, which experience has shown to be the only reliable one, will be alone used. It is impossible to carry out the process of sedimentation necessary for the detection of tubercle bacillus in milk which is received in a curdled condition. The report cannot be sent for a period of four to six weeks from the time the sample is received, but in the case of other pathogenic organisms the time required is much shorter. Samples to be examined for organisms producing taints in dairy produce should be forwarded to Mr. F. J. Lloyd, F.C.S., Muscovy House, 6, Trinity Square, London, E.C.

THE BRITISH DAIRY INSTITUTE, READING.

The British Dairy Institute was established at Aylesbury in 1888 by the British Dairy Farmers' Association, and several hundred students were successfully trained there in different branches of dairy work. In order that students might have an opportunity of combining with the practical study of dairying a more complete scientific instruction, the Institute was, in 1896, moved to Reading, and placed under the management of a Committee representing the British Dairy Farmers' Association and Reading College.

The Institute contains large milk-receiving, butter-making, and milk-testing rooms; rooms for the manufacture of pressed, unpressed, and soft cheeses; and for the ripening and drying of different varieties of cheese. It is equipped with the best modern apparatus for the manufacture of dairy produce.

The instruction given is both practical and theoretical, and is arranged to suit the requirements of those who need either elementary or advanced dairy instruction, or who wish to perfect themselves in the manufacture of any special variety of dairy produce.

The Institute is open all the year round, with the exception of the Christmas Vacation of five weeks, which commences about the middle of December in each year.

Students may join at any time and for any period.

The manufacture of hard-pressed cheeses extend from March to the end of September, but Stilton and other blue-veined varieties are not made until April.

Soft-cheese making is taught throughout the year.

During the winter months (November to March) instruction is given in butter-making, clotted-cream making, the testing and analysis of milk, bacteriology, the management of various types of separators, the handling and care of milk, and the preparation of starters, etc. Lectures and demonstrations are usually given in the afternoons, the mornings being chiefly devoted to practical dairy work.

Practical and Theoretical instruction in butter-making and cheese-making (including hard-pressed, blue-veined, and soft cheese), £1 per week; £10 for three months; £18 for six months.

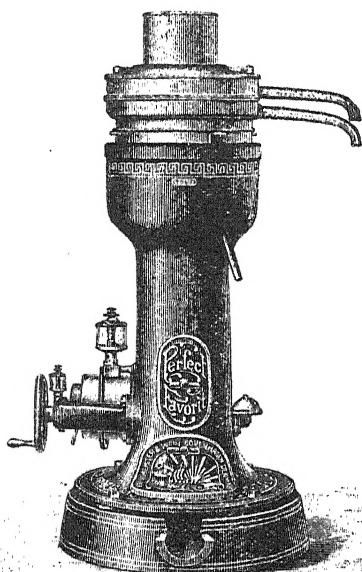
Practical and Theoretical instruction in butter-making only, 10s. per week.

A full prospectus will be sent on application.

WILLIAM C. YOUNG,

Secretary.

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**NEW SELF-BALANCING
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Never beaten in open competition.

Marvellous clean skimming.

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Practically no spare parts
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Godley, near Hyde, Cheshire,
September 8th, 1908.

We have much pleasure in testifying
that the two "Perfect Giant" Separators
supplied by you some three months ago
are giving us every satisfaction, both as
regards clean skimming and economy,
and are quite the best machines we
have had.

Yours truly,

MAYPOLE DAIRY CO. LTD.

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Antiseptic, Hygienic, and Sanitary.

This Company's **MINERAL LITHOFALT ASPHALTE** is specially
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